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TCS 4811/63-KH
G-MB - 771/63
22 November 1963
Copy 1

MEMORANDUM FOR: Chief, Current Support Staff, ORR

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ATTENTION : [redacted]

THRU : Chief, RG/RB/CGS

FROM : Chief, CIA/PID (NPIC)

SUBJECT : New Lands, Kazakh, Siberia

REFERENCE : Requirement No. C-RR3-80,625 (Project No. C 1341-63)

1. In final response to Requirement No. C-RR3-80,625 (C 1341-63), as modified and agreed upon in conversations between [redacted] representing the requ[redacted] representing CIA/PID (NPIC), a study was made from available aerial photographic coverage of northern Kazakhstan and adjacent regions in order to confirm or deny the occurrence of dust storms over this region in 1963 and to evaluate its capabilities and problems as a wheat producing area. A preliminary report on this study (TCS 4563/63-KH; GMB 653/63) was forwarded to your office on 15 October 1963.

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2. During the course of the study briefings and conferences have provided the requestors with current knowledge of the findings of the study.

3. Forwarded for your retention are 30 annotated photographic enlargements (CIA/PID/GMB/P-5004/63 thru P-5033/63, copy 1) and one annotated map (CIA/PID/GMB/P-5003/63, copy 1).

4. The photo analysis on this project was performed by [redacted] CIA/PID/GMB (NPIC), who may be contacted on extension 2548 for any additional information.

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ENCLOSURES:
1. 1 Report
2. 1 Map (CIA/PID/GMB/P-5003/63, copy 1)
3. 30 Photo enlargements (CIA/PID/GMB/P-5004/63 thru P-5033/63, copy 1)

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CONDITIONS IN THE SOVIET "NEW LANDS" GRAIN REGION

In an attempt to estimate current capabilities of Soviet agricultural production, a summary study has been made of available photographic coverage of the Kazakh "new lands" with several related purposes in mind. Of prime interest has been an evaluation of photographs [redacted] and the derivable intelligence contained therein concerning the severity of the reported drought, the nature of the harvest, and the possible evidence of dust bowl conditions or deterioration of the farm land. In addition, earlier photographic coverage which is available for limited portions of the region for the years of [redacted] has been scanned for comparison with [redacted] material to reveal seasonal differences between years and progressive surface and use changes. In order that this report may be more comprehensible to nonscientific personnel who may be concerned with the evaluation as a whole, a brief review is made of the nature of the regional land surface and climatic conditions and of the general conditions under which wheat can be produced within the geographic region.

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The "new lands" of northern Kazakhstan and bordering oblasts included in this analysis cover an area of approximately 200,000 square miles. The outer limits in all directions are roughly marked by the meridians of 60° and 80° East Longitude and the parallels of 50° and 55° North Latitude. The northern boundary of the Kazakh republic and the southern boundary of the Arctic drainage basin are outlined on the accompanying map. For purposes of analogy the area may be compared to the agricultural land of the Canadian plain between the Rocky Mountains and the eastern border of Manitoba from the U.S.-Canadian boundary to the northern limits of wheat cultivation in the Peace River country. Also like the Canadian counterpart the area of concern is confined almost entirely to the southern end of a plain that slopes gently toward the Arctic Ocean. The cultivated land reaches to elevations of over 2,000 feet above sea level in places near the southern limit of the western Siberian plain at the watershed near Karaganda. An airline distance of over 1,000 miles separates Karaganda from the mouth of the Ob' River, the plain's master stream, thus providing a general drainage slope of approximately two feet per mile. It must be recalled, however, that headwater areas of stream basins generally have above-average gradients, and that locally there are important greater differences in gradient on the southern plain surface and its established streams.

Within the region several distinct local areas provide topographic differences that affect their value as wheat land. These are the lower plain and lake district, the higher plains with low mountains, the undrained basins with saline soils, and the drier steppe near the drainage divide in the south.

The northern part of the plain ranges from about 400 feet above sea level near Omsk and Petropavlovsk, both approximately 55° North Latitude, to near 1,000 feet near Kokchetav above 53° North Latitude, and in broad arcs southeastward along the Irtysh to approximately 51° North Latitude, south

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of Pavlodar, and southwestward to near the Kazakhstan border between 51° and 52° North Latitude and 62° East Longitude. Throughout this lowland the original soil cover appears to be thick and probably fairly heavy. The gentle slopes are cultivable without excess soil wash and broad areas are almost wholly under cultivation. Within this region major streams flow northward except in the karst areas or lake districts where the water is generally carried away undergound and soils appear to be less fertile.

From Kokchetav southward through the central sector the general level of the land rises gradually to an elevation of 2,000 feet. Scattered outcrops of rocks forming low hills and mountains are intermingled with isolated lakes and a complex of small streams that ultimately drain northward. On the southern fringes of the upland are several major salt lake basins which all but separate the drainage basins of the Arctic and Aral seas. The higher south central and lower northern sections are similar in relationship to the higher and lower sections of the American Great Plains. In the higher areas slopes are generally steeper, soil cover thinner, and precipitation probably lighter. The native grasses are probably much shorter and more sparse than in the lowland to the north.

Within the northern Kazakhstan "new lands" region the percentage of the land surface that has been plowed varies from close to 100 per cent on the broad flat plains between major stream valleys to an estimated 30 per cent or less in the outer fringes of the area toward the desert and in parts of the lake district where karst topography has been developed on the underlying limestone. Where the percentage of cultivated land is high it can be assumed that much of the surface is plowed annually for cereal production. In the fringe areas there may be annual cultivation of modest proportions even in normal years, with greater emphasis there on hay and pasture economy.

On further analogy with Canada, the long, cold winters and shorter summers provide a growing regime in which rye, barley, oats, millet, and spring wheat are the possible cereals. Hay and pasture lands, with either cultivated or native grasses, are commonly present. Fall seeded crops, such as winter rye and cultivated hay which may remain on a field over several seasons, are subject to winter killing. Winter weather is too severe for the growing of fall-sown winter wheat. and consequently the wheat, which is currently the principal crop, must be the spring seeded variety. Because wheat is commonly sown on newly plowed land, the fields to be sown to wheat are plowed each year whether in the spring after the frost is out of the ground or during the previous fall after harvest. Both practices have disadvantages. Spring plowing wastes time precious to early seeding and plant growth. Fall plowing leaves the fields open to erosion by later fall rains and by wind throughout the winter unless the field is snow covered. Occasionally fields lie uncovered practically all winter, and, if the topsoil is dry from lack of fall rain, severe drifting may take place. While the crop is growing it is also susceptible to late spring and early

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autumn frosts, to blights, insect and animal pests, hail, wind, and excessively heavy rains, to burial by soil wash or uprooting by erosion during heavy rains, and, if the land is dry, to smothering by drifting soil or to being laid bare by removal of the soil by excessive winds. On the plains appreciable wind is almost constant, and soil erosion must be guarded against by good land management.

Semiarid plains regions such as this frequently have a low water table as the result of precipitation deficit. Above the permanent water table there may be several inches or a foot or more of soil and subsoil in which there is insufficient moisture to sustain plant life. The permanent vegetation, including native grass, has long underground root systems reaching to the water table, but annual plants, including newly seeded wheat, are dependent largely on the seasonal precipitation which may be confined to a few inches of soil immediately beneath the surface, and are unable to penetrate the dry layer of earth that may separate the two water tables.

Most of the large lakes are comparatively shallow, and, though they may be well filled during the spring months, especially if winter snow cover and springs rains have replenished them, they customarily have low water levels during summer and fall seasons. In this respect they are like the playas of the Great Plains of the United States. And also, like the playas, they are depositional sites for wind borne soils and drifting field cover. If the deposition into them exceeds the rate of underground corrosion of the limestone, in which they have been developed, they may become completely filled with soil and cease to exist as lake basins. On the maps of this region there are several major lake basins with only remnants of the waterbodies that once occupied them. When the normal routine of this interplay is aggravated by excessive drifting of the soil, basins that appear to be well occupied by water actually hold little of it because they are extremely shallow. In the areas lacking drainage outlets, the soils are apt to be saline in character, with the salinity in the topsoil becoming increasingly detrimental to crops with continued cultivation over a period of years. In such locations which have not suffered excessively from either lack of normal moisture or from soil removal, the yield of cereals from the fields can be expected to increasingly diminish.

Wheat, a native of a semiarid region, grows best on a medium to heavy soil with good moisture retention capacity but with good drainage. It is able to withstand periodic conditions of drought and still yield a good harvest providing it has had plenty of soil moisture during critical periods in its growing cycle. These periods come when it sprouts, sets roots and begins to grow, when it stools and sends up stalks for its blossoms and heads, when the heads form and blossoming takes place, and when the kernels fill immediately before ripening. A bumper crop may result if the rainfall at these times is favorable. In a year when moisture is not available at these critical times the land may not produce enough wheat to replace the seed. Statistics from the Pavlodar and Aktyubinsk oblasts for the year of 1955 appear to indicate such a condition during that growing season.

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25X1D Photographic coverage of [redacted] of the lake district northwest of Petropavlovsk at the northern edge of the area of interest (Figure 1, 55 15N-68 00E, Location 1 on the map), compares well with that of [redacted] 25X1D (Figure 2), for indications of seasonal moisture. The [redacted] coverage reveals 25X1D partial snow cover on the landscape and ice cover on most of the smaller lakes. Apparently the bare land is that under cultivation, while snow remains on the surface that is covered with vegetation. Such a condition reveals either earlier melting from the darker, plowed fields or greater accumulation from wind drift on the non-plowed land. The larger lakes are 25X1D open and at their approximate highest level for the season. In [redacted] photographic coverage of the lakes reveals lowering of the water level, particularly in the twin lakes common to both photographs, but there is neither obvious indication that rainfall is lacking nor reason to believe that 1963 agricultural conditions were sub-normal in the locality.

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Northeast of Kokchetav, in the central part of the lowland plain, are several large lakes for which interesting [redacted] is available 25X1D for comparison. On the photograph of late [redacted] (Figure 3), the shore- 25X1D line of the large lake (Ozero Kishikaroy, 54 00N-71 20E) is obviously lower than it had been sometime earlier in the season, perhaps a month or more earlier. Just one week later, in [redacted] (Figure 4), the lake level appears 25X1D to have dropped markedly. The higher level of the [redacted] shoreline is still 25X1D apparent along much of the shore. To the conclusion that the lake had decreased in actual size must be added the probability that the lowering took place where water was extremely shallow and there had been no unusual evaporation. On Figure 5, [redacted] the same lake appears to be 25X1D better filled than on either of the [redacted]. Again it should be 25X1D noted that snow cover is lacking on plowed fields, which therefore begin the growing season with a lesser volume of soil moisture than the grassy fields nearby. In sharp contrast to these three photographs is Figure 6, dated 25X1D [redacted] wherein the large lakes appear to be dry or nearly so. It must be realized that the color tone of this photograph differs markedly from that of the other three, and that there may be reasons other than climatic conditions, such as haze and poor photo quality, for the appearance of the 25X1D lake. In seasonal contrasts between the two years, the most obvious certainty is that in [redacted] there was no unusual moisture deficit.

Much farther southeast at Pavlodar (52 15N-77 00E), both lake level and 25X1D the general tone of the Irtysh River floodplain, on photography of [redacted] (Figure 7), appear to indicate more available moisture than do those same 25X1D natural features [redacted] (Figure 8). It should be noted that the Irtysh, the region's main stream, whose source was a permanent lake that has been replaced by a reservoir, has the region's only floodplain. This floodplain continues fairly wide for some distance upstream, as shown in Figure 9 (51 15N-78 00E), but is locally narrow in places downstream, as at Omsk (Figure 10, 55 00N-73 10E). Thus the general aspect of the lowland region is a monotonously flat plain, only surficially etched by streams. An excellent example of intensity of farming in the lowland is illustrated in Figure 11 (a large-scale view of a portion of Figure 10). There are minor bottom-lands in the lowland plain along the Tobol near Kustanay (53 10N-63 40E) and the Toguzak near 53 25N-61 00E, as revealed in Figures 12, 13, and 14; and near 53 50N-62 10E (Figures 15 and 16). A minor valley has been cut by the local headwater portions of the Nura on the upland plain south of Akmolinsk (Figure 17, 50 30N-71 30E), and another by a small stream in the upland plain near Ekibastuz (Figure 18, 51 40N-75 20E), but these streams run intermittently into salt flats.

Some of the streams have only narrow trenches with systems of gullies as probably intermittent tributaries. Of this group, the Ishim (Figure 19, 53 20N-67 00E) is tributary to the Irtysh. The Selety (Figures 20, 21 and 22 near 52 30N-73 15E) drains into the basin of Lake Seletytengiz (53 00N-73 00E), one of the largest salt lakes of the lowland plain. In its upper headwaters the Selety is little more than gully system (Figures 23 and 24, 51 20N-71 45E). Severe gully systems are notable in Figures 17 and 25 (51 25N-65 45E).

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On the lowland plain, above the local river valleys, as at Omsk (Figure 11), southwest of Kushmurun (Figure 26, 51 50N-63 00E) and elsewhere there are broad areas with field patterns indicating an almost complete plowland cultivation and an almost complete lack of integrated drainage. There is little evidence of sheet wash or soil erosion by running water. These areas represent a climate regime where practically all the precipitation remains at or near the surface and disappears in evaporation and transpiration, leaving little or no accumulation for surface drainage. That this has long been the normal condition becomes obvious upon survey of the map which reveals that over long distances the land surface is practically flat. Many large lakes within this flat land have never developed surface outlets because there has not been enough concentrated precipitation to raise them above the rims of the shallow depressions in which they lie. This is quite in contrast to the upland area, represented by Figure 27 (50 05N-72 55E), where integrated drainage has been induced by both elevation and differences in bedrock composition. The flat lands appear to be productive during seasons when rainfall is sufficient for normal agricultural needs, but their susceptibility to failure is revealed when the rainfall of an individual season may be so meager that crops fail to cover the ground and wind erosion takes place, as in Figure 28 (52 55N-74 30E) near Irtyshskoye. 25X1D

That wind erosion is not confined to [redacted] but has been serious at least locally for several years, is evident. Photography of [redacted] (Figure 23) reveals a principal road out of Akmolinsk practically clogged by drifted soil, and adjacent fields whose boundaries are almost indistinguishable for the same reason. This single example represents many scattered observations of earlier wind drift. In some localities an attempt has been made to counteract severe wind erosion by systems of "field and fallow" management, such as that east of Pavlodar (Figures 7 and 8). These identical field patterns and the severe drifting of soil were both visible on photography of [redacted] 25X1D

25X1D

Winter photography over this region reveals still other aspects of farm mismanagement, moisture deficit, and soil wastage. Figures 20 and 21 illustrate the conditions endured by good farmland in consecutive winter seasons of [redacted] photography shows the effects of wind erosion on fall-plowed fields where topsoil moisture was insufficient to hold the surface of the fields in solid form during the subfreezing part of the year. It is evident that snow has fallen in the area for it overlies adjacent fields. But most of the fall-plowed land appears to have lacked any means of staying the snow and, instead, both it and the topsoil have been blown from the fields. The general direction of westerly winds is obvious in the pattern of clear and drifted edges of field patterns. That the experience of this and probably previous years has not diminished the practice of leaving fields open to such denudation is evident in the photograph of the [redacted], where some of the same fields are again open to the ravages of the winter winds.

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In this study, the movement of dirt into the atmosphere has not been observed on a large scale such as that commonly associated with the regional dust storms of the American Great Plains in the Dustbowl era. Nor can it be determined that such storms do not take place in the "new lands" region. The appearance of the local movement of soil, as shown in Figure 28, and less noticeably in Figures 7, 8 and 9, leads to the expectation that, except for ground pattern revelation of past storms, the significant indication of a dirt storm on overhead photography is that the analyst "loses contact with the ground". Stereographic study of these two and similar locations demonstrates this fact, and leads to the expectation that a general condition of dust in the atmosphere would result in a haze or overcast condition on the photography that is difficult, if not virtually impossible, to distinguish from poor perceptibility caused by atmospheric humidity, blowing snow, or even smog.

In the course of the survey an effort has been made to gauge amounts of local precipitation by study of local reservoir and stream levels, but the evidence is inconclusive. The volume of water in reservoirs may reflect changing industrial or communal aspects from year to year. An interesting case in point is the change in the reservoir at Temir Tau (50 05N-72 55E) from [redacted] (Figure 27). 25X1D
Obviously the reservoir is lower [redacted] but extraneous industrial uses 25X1D and expanding local irrigation may have contributed to the depletion, which cannot be considered wholly due to insufficient inflow caused by lack of rainfall. Stream flow may vary widely from one season or year to another, but if, as explained in the preceding paragraph, there is insufficient moisture for integrated runoff, a crop could still be well watered by fortuitously spaced showers that added little or nothing to local stream flow. Moreover, such evidence might be strictly localized in time and fail to reflect seasonal regional circumstances. Small reservoirs on local streams can be expected to be dry or nearly so during late summer.

A more revealing aspect of the effects of local precipitation on farmland is found in widespread evidence of sheet wash removal of topsoil and gully development that has ultimately decimated large areas of the plains. Sheet wash is evident in many portions of the region portrayed on several of the accompanying illustrations. The soil wash visible in Figure 28 is somewhat surprising in view of the fact that this location is on one of the flat, lowland portions of the area. It was probably induced by excessively heavy rain on slightly sloping ground or possibly by heavy rain action following irregularities in a plowed surface. At any rate, such soil wash would hardly have taken place had not the sod cover been broken by the plow.

A network of gullies and soilwash is evident in the right hand portion of Figure 24. Close comparison of field patterns in Figures 23 and 24 reveals that between the dates of the two photographs plowing was extended in some of the fields near the west end of the drifted road. The fields which were suffering from wind erosion in Figure 23 appear to be denuded of much of their topsoil, with the rivulet pattern revealing a subsoil phase.

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Throughout the area the fields display a naked appearance that results not only from lack of uniform vegetation cover but also from removal of the top, friable soil blanket down to the actual underground framework of the subsoil. This same characteristic, noted particularly in the higher plains region, is apparent near Temir Tau (Figure 29), and especially on Figure 30 (50 45N-71 25E), as well as near Bestobe (Figure 22), and south of Akmolinsk (Figure 17). The latter illustration is a typical example of formerly gently sloping, grass-covered land surface, badly abused by farming practices, with the fields on all sides being eroded and abondoned until there remains not a single land square that has been spared from erosion. The future of this tract can hardly be as a producer of wheat. That this is not an isolated example is shown by Figure 25, where erosion is visible in two directions from the crest of land. Close scrutiny of this photography also reveals abandoned fields.

Evaluation of the wheat harvest in the region of interest involves two essential difficulties: differentiation of wheat from other crops and the estimation of bushel or ton values of the grain from traces of harvesting on the ground. A much more time-consuming and critical areal evaluation than this report attempts to provide would encounter the same problems, because of the nature of the source of intelligence, and the additional lack of complete consecutive coverage makes such estimating undesirable.

The degree to which cereal cropping can be distinguished from other use of the known cultivated and rectangular fields can be demonstrated in an analysis of Figure 11. Except for irregular strips along the main water courses and lakes and the essential needs of railway, road, and settlement use and portions of the powerline right-of-way, the land here is in rectangular fields with linear patterns indicating machine cultivation. For some of the fields whose patterns are restricted to plowing, crop identification is limited to that of a pasture or hay field or a cereal crop not yet harvested by the date of the photography, which was [redacted]. Widely scattered over some of these fields are white rectangular objects. These appear to be hay or straw stacks and, since the fields show no recent harvesting traces, it is possible that these are the remains of [redacted] held in reserve for [redacted] winter needs. This is common practice where a planned number of animals must be provided with essentials. It is barely possible that the stacks may be a late [redacted] hay crop on a field planned to yield two crops per season, but this is hardly likely at 55° North Latitude. At any rate, the fields with stacks do not appear to contain a [redacted] wheat crop. The fields with mottled appearance show traces of vegetation and soil differences. Some of these variations are due to surface drainage and moisture retention capacity of an apparently variable soil. Others indicate slight drifting of soil by the wind, none of which appears to be serious. In some cases the darker tones of some fields may indicate a heavier crop but light tones of unharvested fields may indicate increasing maturity of a crop soon ready for harvesting. The fields with the lightest tones are the harvested ones. One or more of these has a simple pattern of widely spaced

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light lines running lengthwise of the field. These lines appear to be windrows of hay, some of which have been cleared and stacked. Most of the fields show machine-use patterns that begin at the outer edges, turn diagonal corners, and encroach increasingly upon the field to end, finally, as some of them do, with a center swath matching the darker diagonal lines. These are fields where either mowers or combines, probably the latter, have removed the grain. On some fields the straw is stacked. From others it has been removed, or it may lie in rows as dropped by the combine. Whether these grain fields are winter rye, oats, wheat, or some other crop cannot be judged. The date is a bit early for major wheat harvest, but with an early spring and good summer weather it is not impossible. No estimate of bushel values can be made from such observations because, in addition to estimating straw crop, there is no reliable proportional estimate of grain from amount of straw. It is expected, however, that the relationship is a positive one, and that, in a situation such as illustrated in Figure 11, the widespread harvest and amounts of remaining straw are indicative of good times for the locality. Comparison with the growing season of [redacted] is limited to coverage of [redacted] (Figure 10). There is no indication of unusual climatic conditions. The slightly lower level of the stream-channel reservoir cannot be regarded as critical of field moisture amounts.

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In a quite different part of the region it was possible to compare [redacted] of a selected area. The particular [redacted] photograph was chosen to show an interesting cropping practice illustrated at the north end of Figure 12. Here apparently a binder was used to lay down bundles in rows across the field. Along the upper left-hand side of the field some of these bundles have been shocked, the shocks to remain while the grain dries or awaits the convenience of a threshing machine. This is common practice where combines are not available or where grain, when cut, contains too much moisture for safe storage after separation. The date of this harvest, [redacted] almost requires that this was a fall-seeded crop, probably rye. Other crops in the area have not matured.

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Figure 13 shows harvest in full swing in the same area in [redacted] The field of interest in Figure 12 appears to be only part of a larger plot whose crop quality cannot be determined. Harvested fields cover most of the wider region, but the tracking and other patterns in this area lack the quality exhibited in Figure 11, discussed above. This is a region peppered with small sinkhole lakes; the soil may be more alkaline or otherwise less fertile than that of the well-drained lowland near Omsk. Along the railway there are uncultivated areas that appear to be partially brush-covered, probably native hay and pastureland. Completely aside from the agriculture, it is noted that, probably in the interests of construction economy, the railway has not been graded as a straight line across the local stream valleys. Trains are required here to slow down and then regain speed at each stream crossing.

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25X1D Photography dated [redacted] (Figure 14), does not allow harvest comparison. The general tone of the landscape appears normal. There are no signs with which to forecast crop failure. Of special interest in this illustration are the rail-served warehouses at Varna. These are for grain storage and, in contrast to our monolithic grain elevators at small towns on the plains, are typical of Soviet Russian grain producing regions. Here estimates of capacity might be possible, but storage of other commodities must not be overlooked, nor the question of the degree of use.

Figure 26 depicts the [redacted] harvest in an area farther south and actually 25X1B in a locality with only interior drainage, along the main divide between arctic and southward-flowing streams. The photograph attests to agricultural activity, but does not indicate the rate of yield. The essential use 25X1B of these illustrations has been to provide a comparison with other sites in [redacted] In contrast to these, Figure 18 shows traces of [redacted] harvest on 25X1B scattered fields in an area where crop cultivation is a marginal activity at best, even though the locality is within the southern part of the region and mainly at the elevations of the lowland.

One pair of photographs provides direct comparison of harvest activity 25X1D [redacted] Figures 15 and 16 may be used to represent the lowland between Troitsk and Kustanay where cereal cultivation has continued for many 25X1B years. In this area it may be practically all wheat and little other grain or hay. By the [redacted] grain harvest had been completed and the dark-toned fields may already have been plowed for next spring's planting. On a field by field comparison it is virtually impossible to establish for either year a good or poor record. From this several possibly disagreeing conclusions can be drawn: there was no difference between the two harvests. Each represents a normal year in this area despite reports of regional disaster. Each represents a poor year, and the margin of distinction lies not in the extent and appearance of field pattern but in the unapparent quality of the harvest. Regardless of its quality, there may be an official requirement to harvest, a requirement that is bolstered by need when the gamble is on a single all-important crop.

25X1D Half of the 30 illustrations in this report are taken from photography of the [redacted] They have been chosen, as nearly as possible, to represent the various physical aspects, growing conditions, and cultivation practices over the area of northern Kazakhstan and adjacent agricultural plains. From them and the photography which they represent has been developed an impression of the [redacted] growing season as one which 25X1B probably began with a fair or normal amount of moisture in the soil. Early spring rainfall may have been almost wholly lacking, and this deficit, possibly coupled with an unseasonably warm period in [redacted] 25X1B may have so affected the tender young seedlings that even abundant rainfall, if it came later, could not have overcome the damage. [redacted] 25X1B
25X1B [redacted] the land appears to have been semiarid, dirt blew from fields, and there was a lack of dark tones in photography that represents good green landscape. Later in the summer rain appears to have put new life into deep rooted or native grasses in some locations, but in others the thinness of

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vegetal cover is apparent as one sees the skeleton of the soil in a summer field (see Figures 22 and 27). By late fall the immediate need was probably to harvest whatever could be salvaged from a poor venture. This may not have been an unusual experience in many localities. To the analyst the most shocking element is not the probable drought of [redacted] but the overall denudation, degradation, and abuse of those portions of the region that never should have been turned by the plow. Their use may have added many bushels of badly needed grain, especially under rare favorable climatic conditions in some past years, but their misuse has badly decreased their potential as producers of any crop in the years to come.

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17. Gully pattern south of Akmolinsk, [redacted]
$71^\circ 30'$ E.

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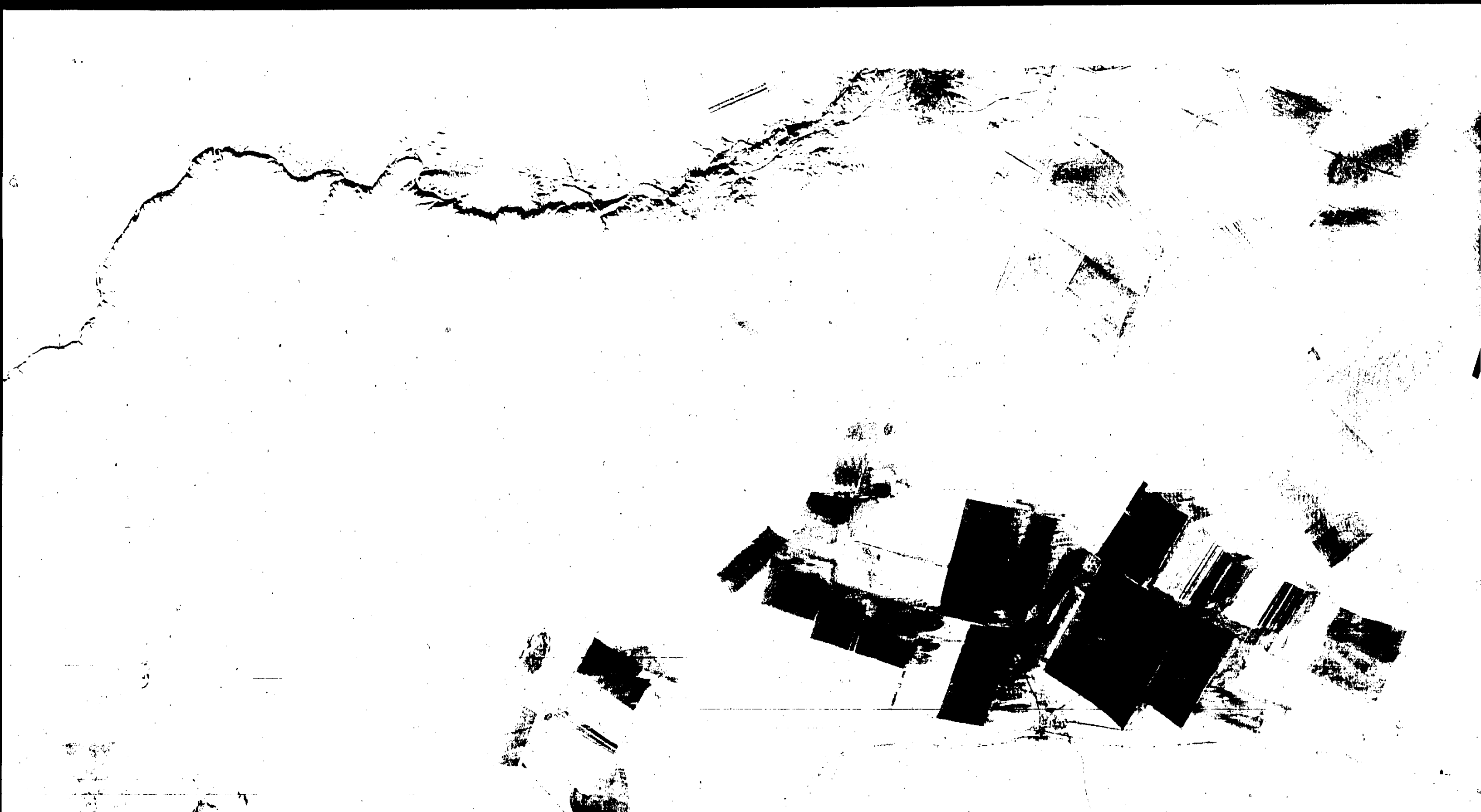

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20. Wind erosion of open fields n
[redacted] 52°30'

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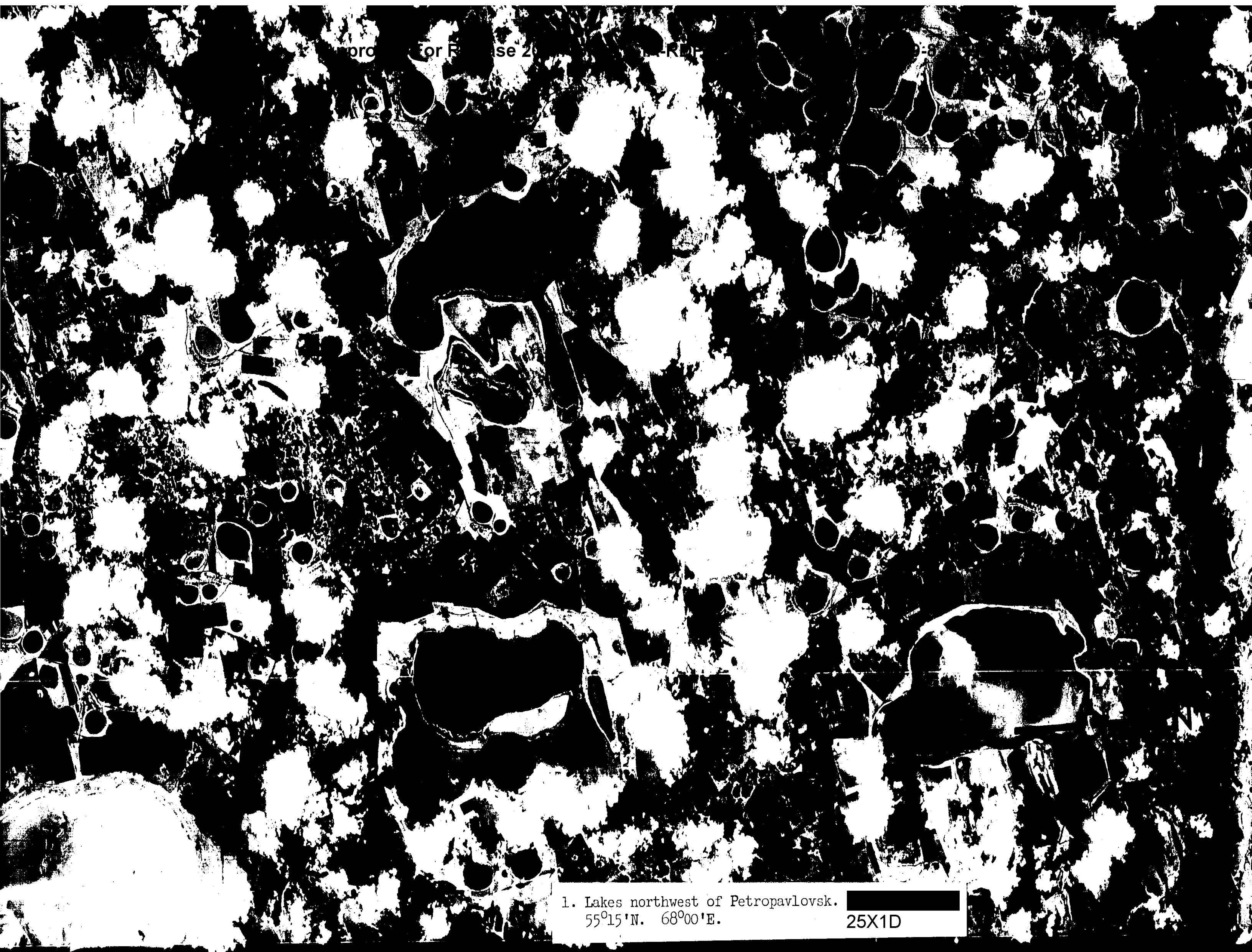
20. Wind erosion of open fields near Bestobe, 52°30'N. 73°15'E.

[redacted]



1. Lakes northwest of Petropavlovsk. [redacted]
55°15'N. 68°00'E.

25X1D

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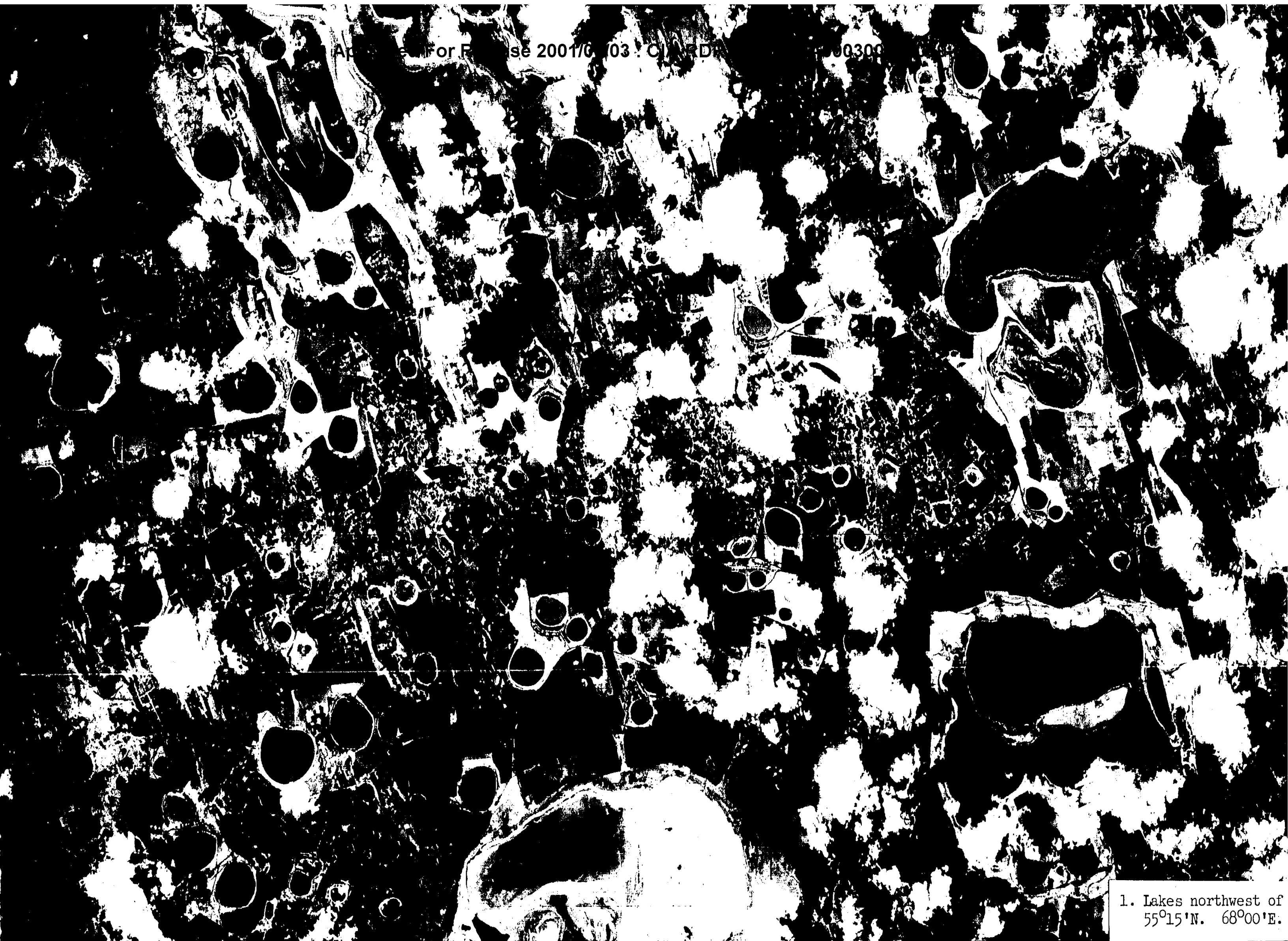


1. Lakes northwest of
55°15'N. 68°00'E.

TOP SECRET RUFF Miss

25X1D

No. 64-3411

7. Landuse pattern at Pavlodar, [redacted]
52°15' N. 77° E.

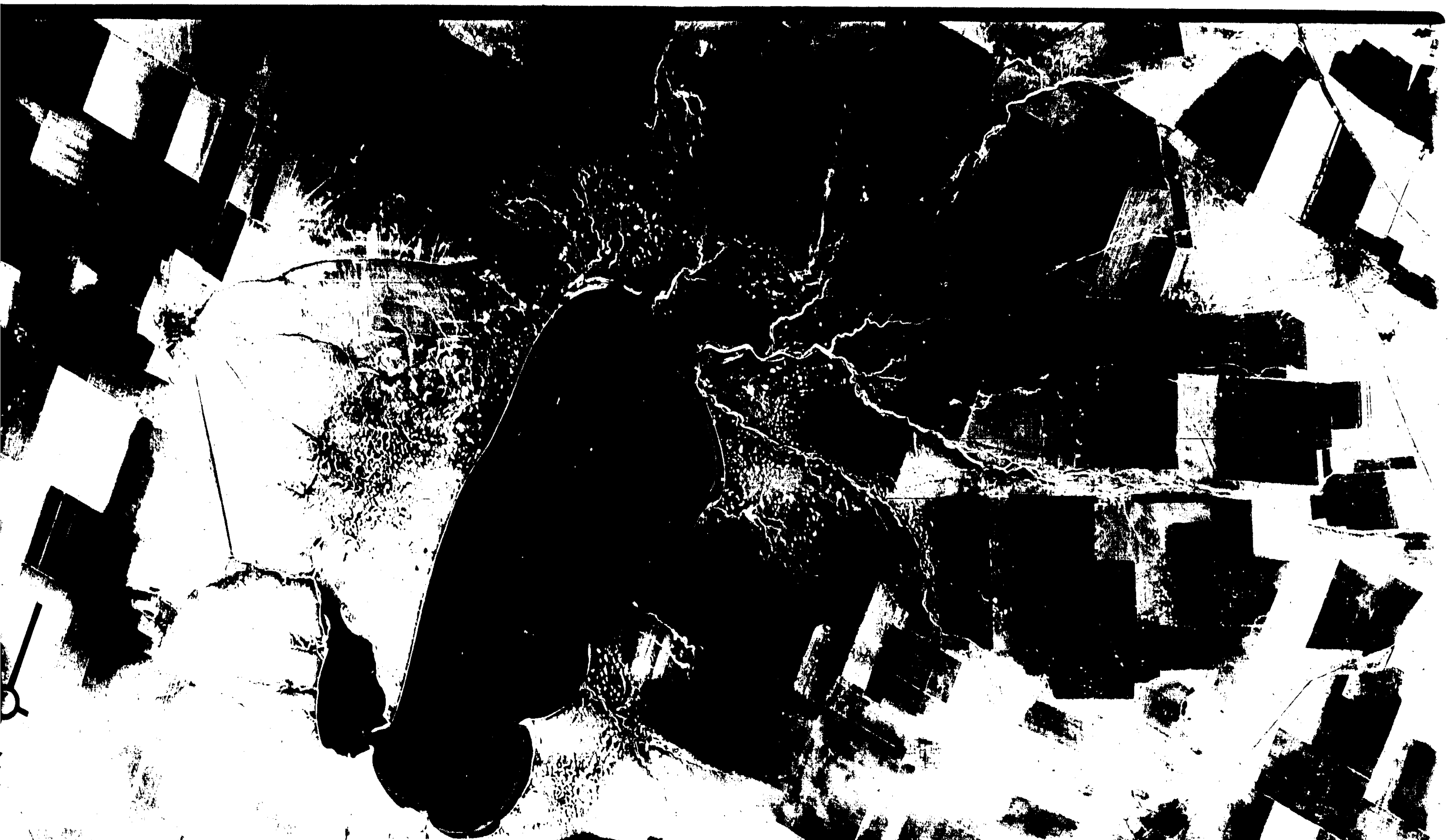
25X1D

25X1D

25X1D

5. Lakes northeast of Kokchetav, [redacted] 54°N. 71°E.

25X1D



25X1D

6. Lakes northeast of Kokchetav, [redacted]
54°N. 71°E.

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03/03 : CIA-RDP78 39A000300020039-8

8. Landuse patt
52°15' N.

8. Landuse pattern at Pavlodar, [redacted]
52°15' N. 77° E.

25X1D

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2001/03/03 : CIA-RDP

[redacted]

9. Wind erosion between Pavlodar and Semipalatinsk, [redacted] 51°15' N. 78° E.

25X1D

25X1D

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11. Field pattern west of Omsk, [redacted]
55°N. 73°10'E.

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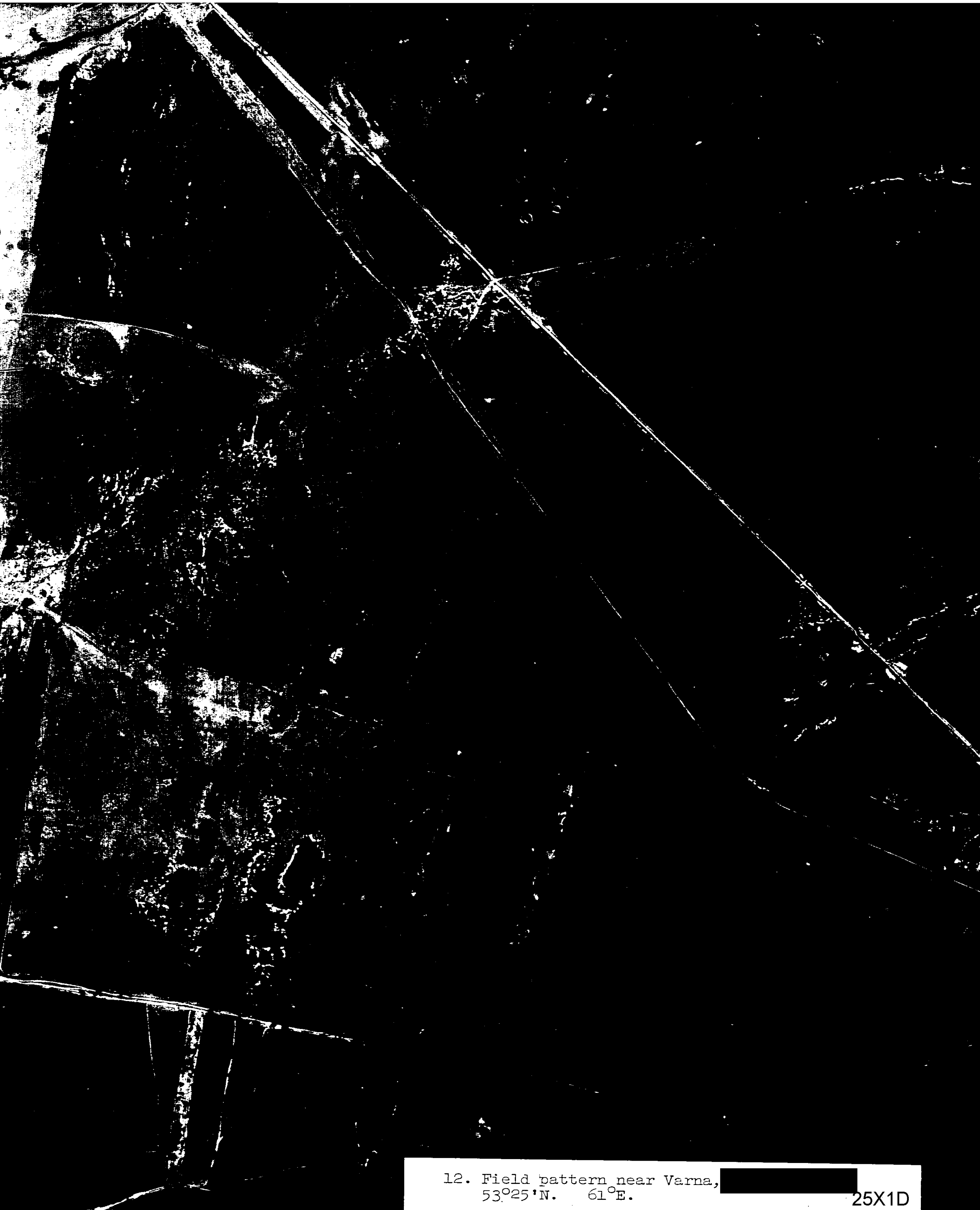
NPIC Job No. 64-4018

Appro... /03/03 : C... RDP7... 300020039-8



12. Field pattern near Varna, [redacted]
53°25'N. 61°E.

25X1D

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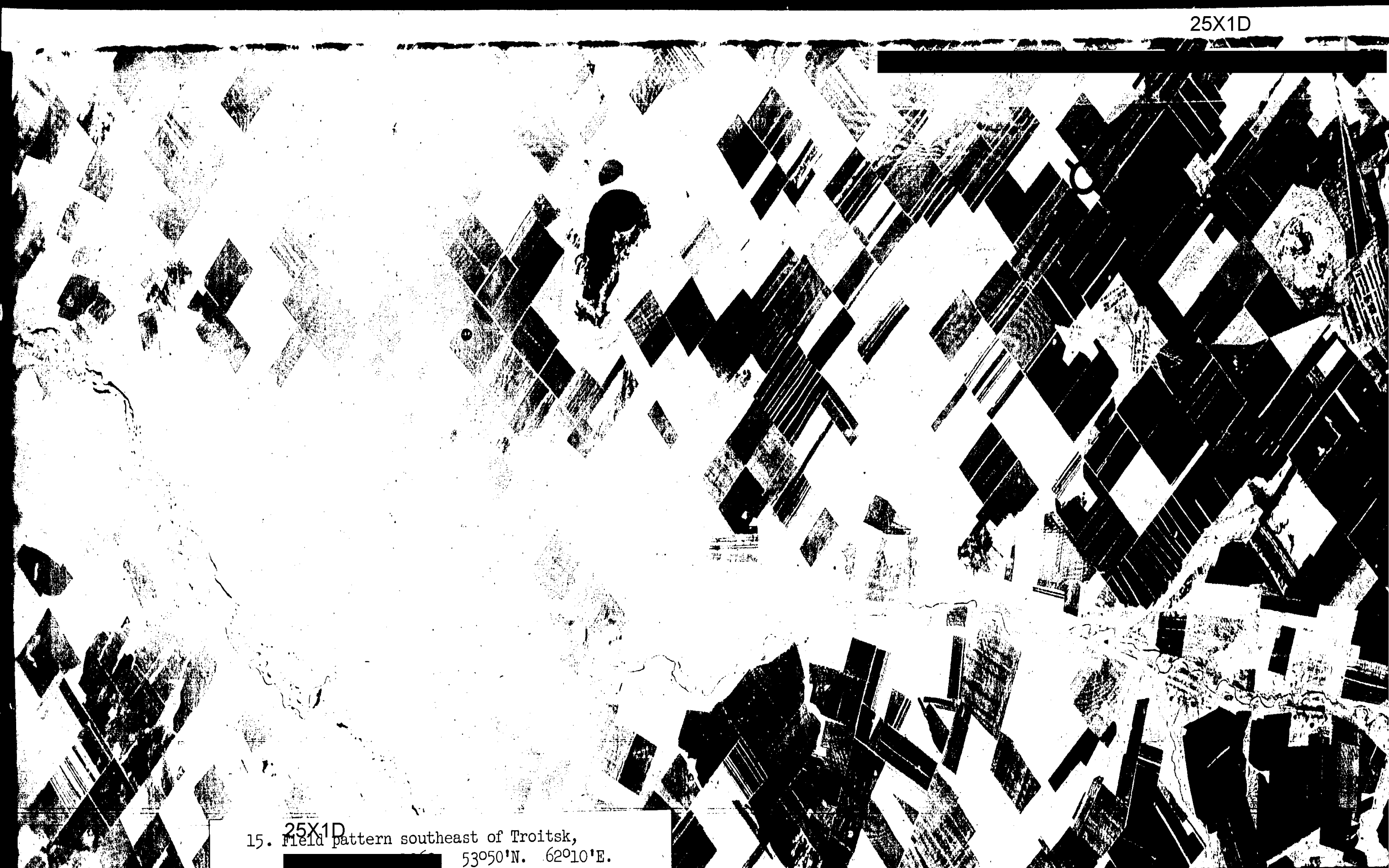
25X1D

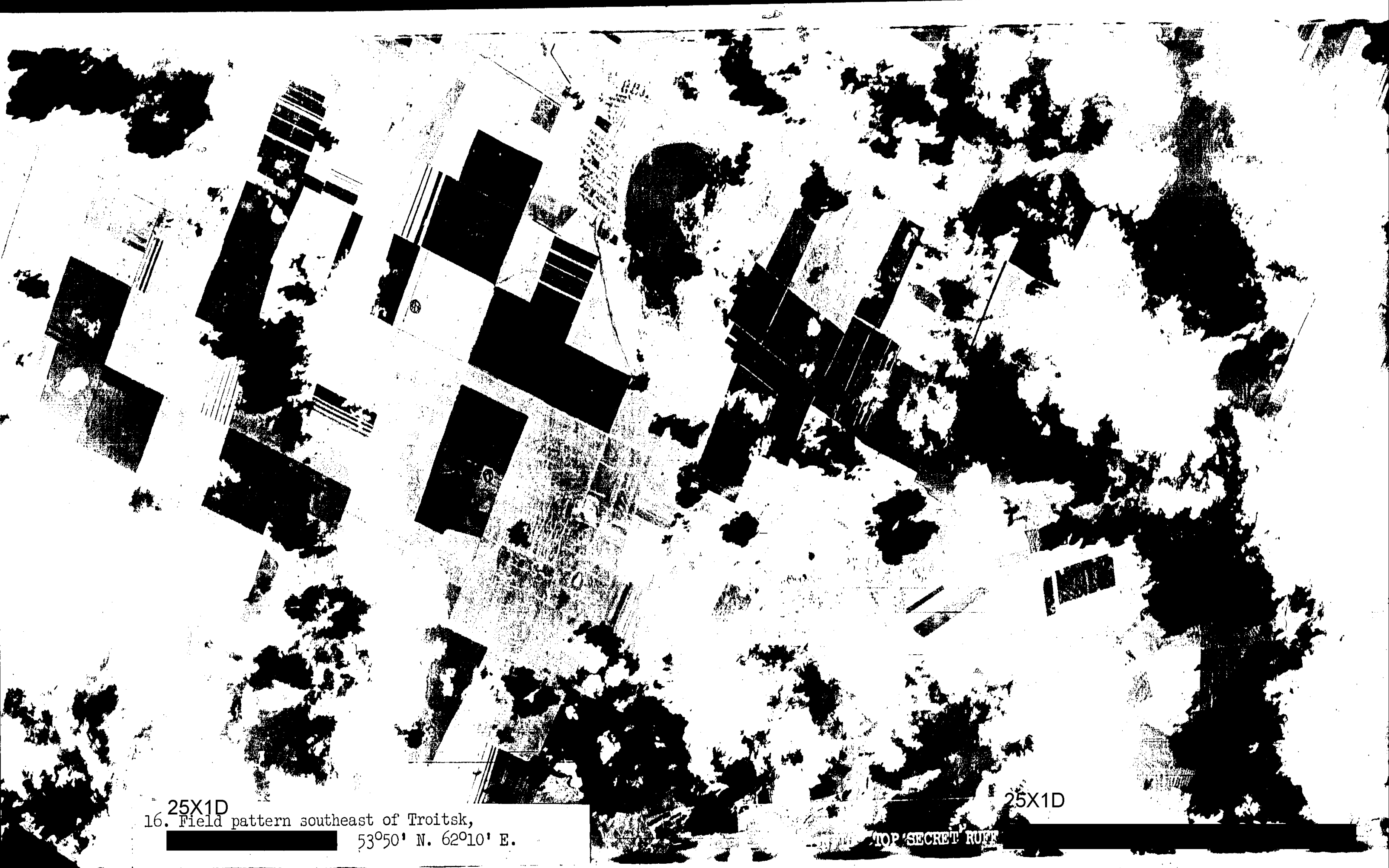
[redacted]



25X1D

15. Field pattern southeast of Troitsk,
[redacted] 53°50'N. 62°10'E.

25X1D



25X1D

16. Field pattern southeast of Troitsk,
[redacted] 53°50' N. 62°10' E.

25X1D

TOP SECRET RUFF [redacted]

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25X1D

[redacted]

Approved For Release 2001/03/03 : CIA-RDP78T05439A000300020039-8

19. The Ishim valley west of Kokcheta
[redacted] 53°20' N. 67°

25X1D

25X1D

valley west of Kokchetav,
[redacted] 53°20' N. 67° E.

25X1D

pproved Fo ... 9-8

23. Drifted soil on road northeast of Akmolinsk,
[redacted] 51°20'N. 71°45'E.

25X1D

25X1D

23. Drifted soil on road r
[redacted].

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NPIC TOP SECRET [redacted]

25. The height of land south of Yesil,
[redacted] 51°25'N. 65°45'E.

25X1D

25X1D

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Approved For Release 2001/03/03 : CIA-RDP78T05439A000300020039-8

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25X1D
26. Field pattern south of Kushmurum, [redacted] 51°50'N. 63°E.

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Release 2001/03/03 : CIA-RDP78T05439A000300020039-8

25X1D
27. Fields and reservoir at Temir Tau, [redacted] 50°05'N. 72°55'E.

[redacted]

25X1D

25X1D

27. Fields and reservoir at Temir Tau, [redacted] 50°05'N. 72°55'E.

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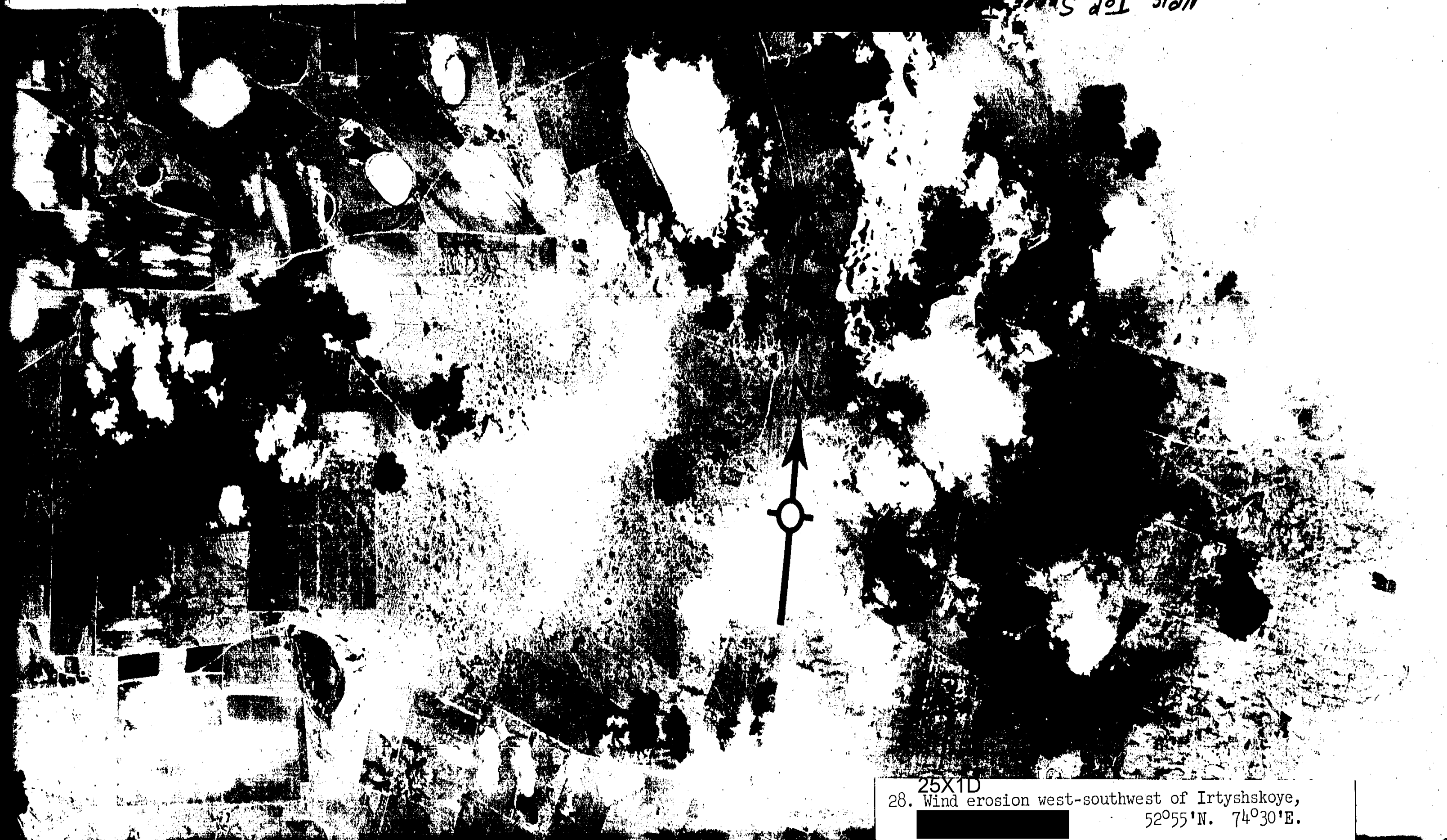
Approved For Release 2001/03/03 : CIA-RDP78T05439A000300020039-8

25X1D

[redacted] NPIC Top Secret



25X1D
28. Wind erosion west-southwest of Irtyshskoye, [redacted] 52°55'N. 74°30'E.

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Approved For Release 2001/03/ : CIA-RDP 39A000300020039-8

25X1D

29. Fields and reservoir at Temir Tau, [redacted] 50°05'N. 72°55'E.

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25X1D

Approved For Release 2001/03/03 : CIA-RDP78T05439A000300020039-8

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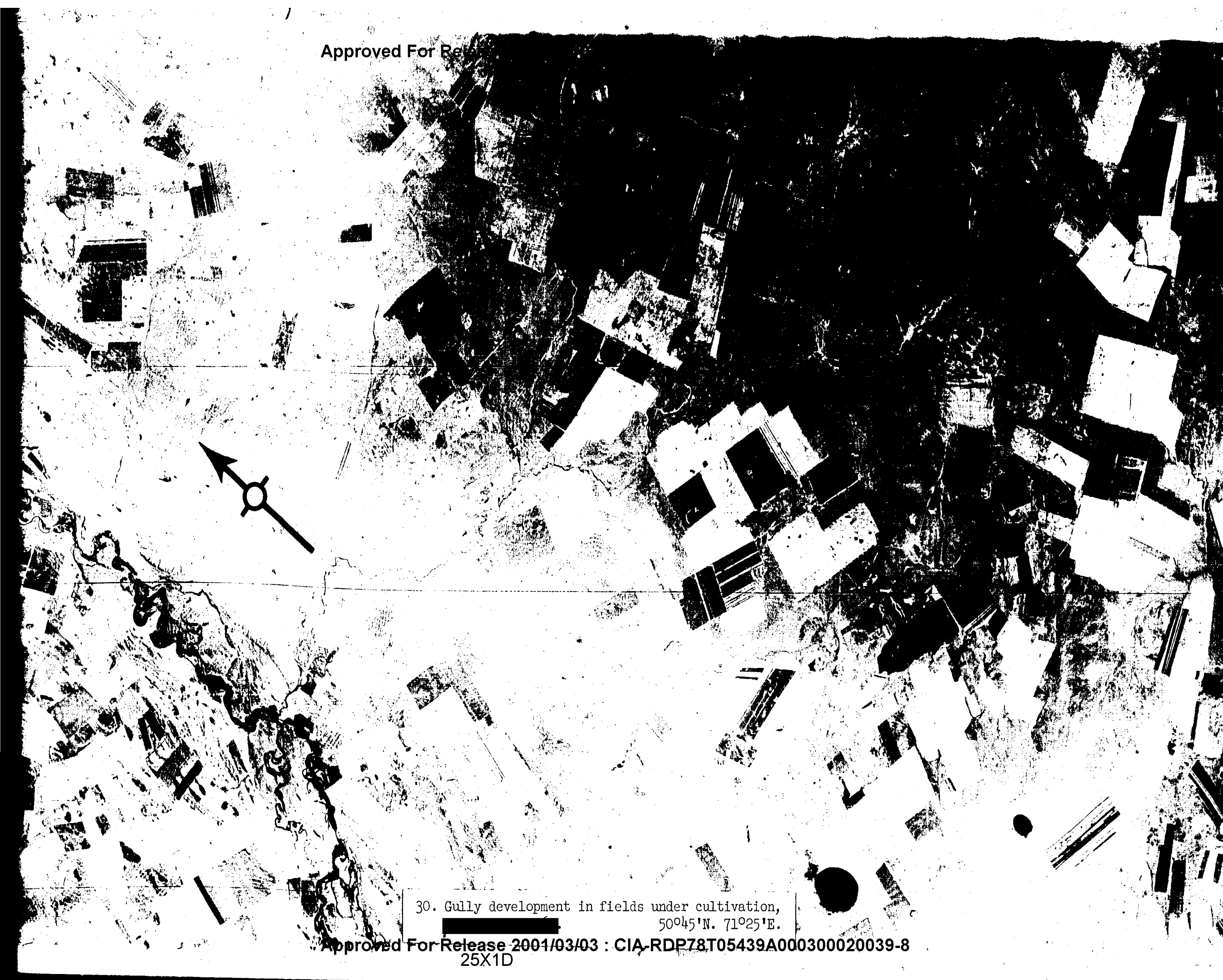


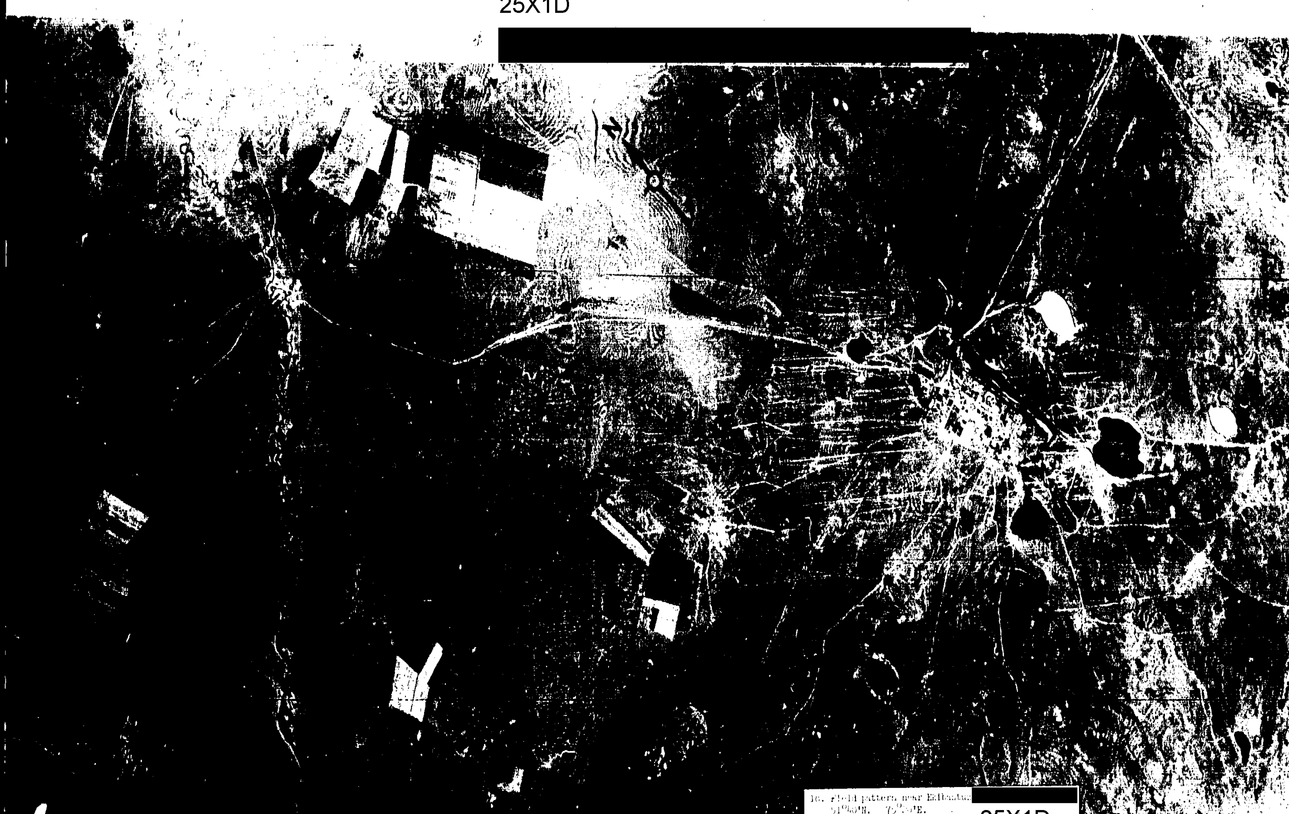
30. Gully development in fields under cultivation, [redacted] 50°45'N. 71°25'E.

Approved For Release 2001/03/03 : CIA-RDP78T05439A000300020039-8
25X1D


N
[redacted] 25X1D
NPIC [redacted]
25X1D

25X1D

[redacted]

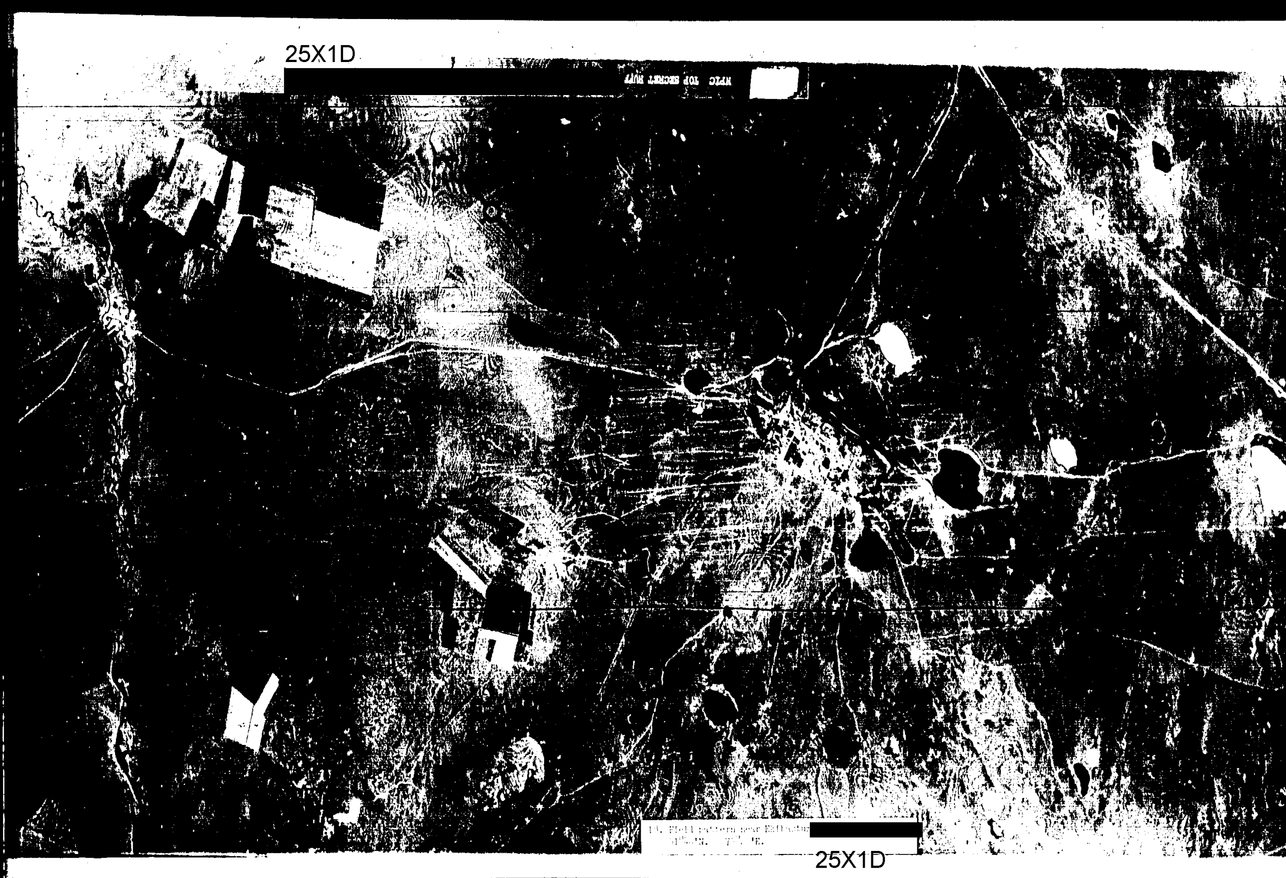


16. Field pattern near Ekibastuz [redacted]
51°40'N. 75°[illegible]'E.

25X1D

25X1D

[redacted]



Field pattern near [illegible] [redacted]

25X1D

21. Wind erosion of open fields near [illegible],
[redacted] [illegible]'N. 73°15'E.

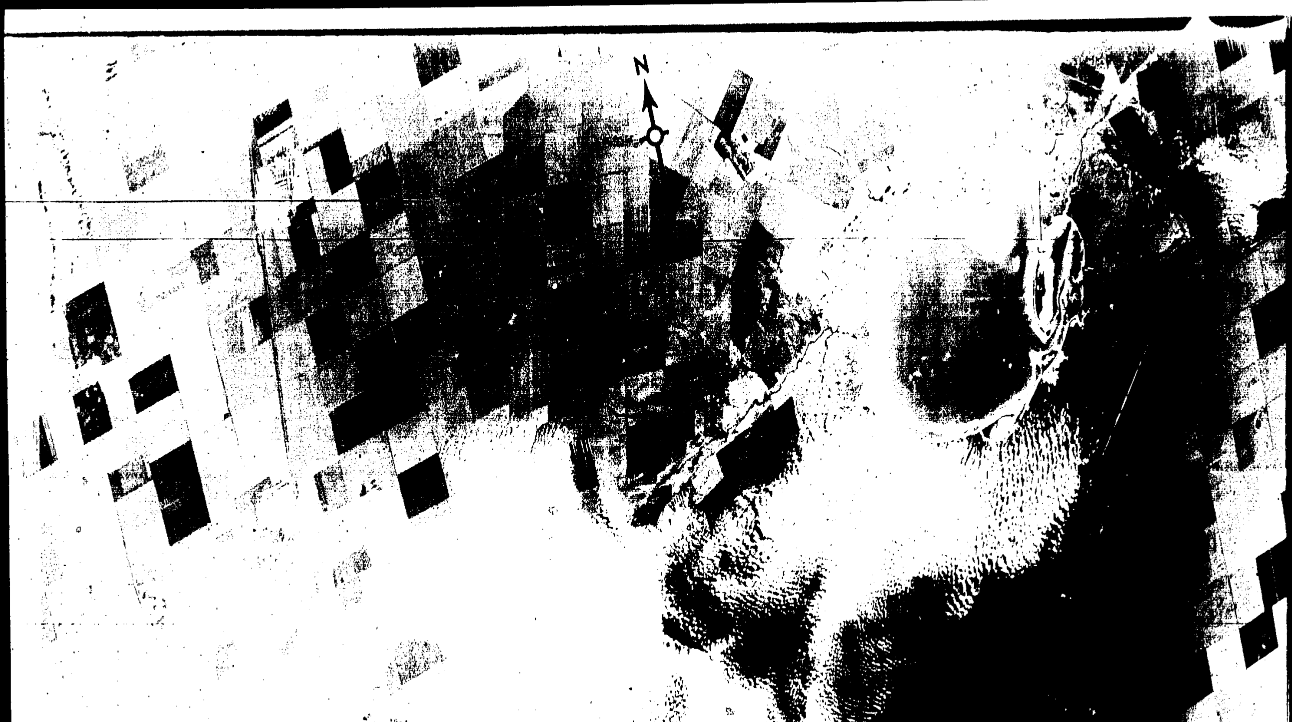
25X1D


25X1D

25X1D [redacted]

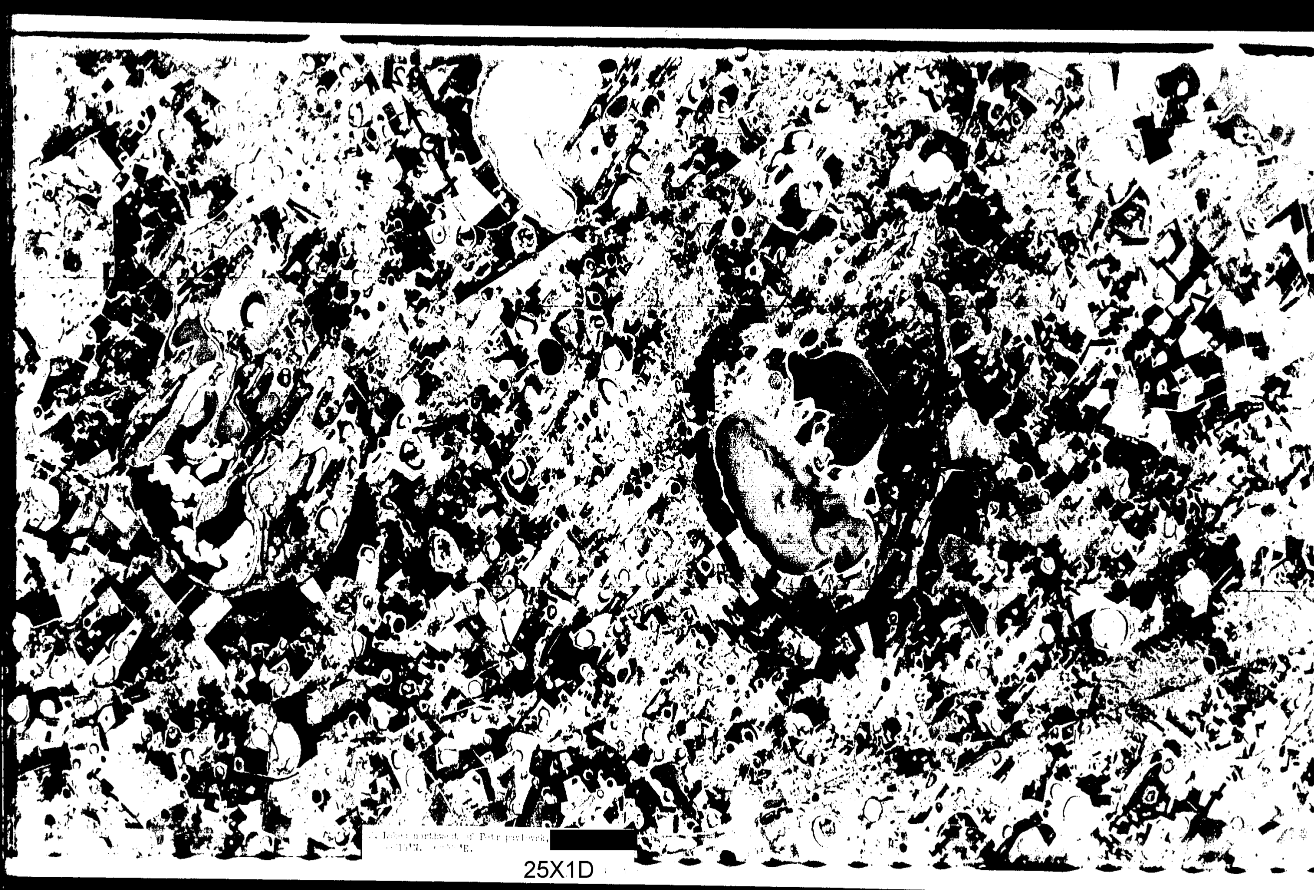
4. Lakes northeast of K[illegible]
34°N, 71°E.

3. Lake northeast of Kokchetav, 25X1D [redacted]
5[illegible]°N. 71°E.



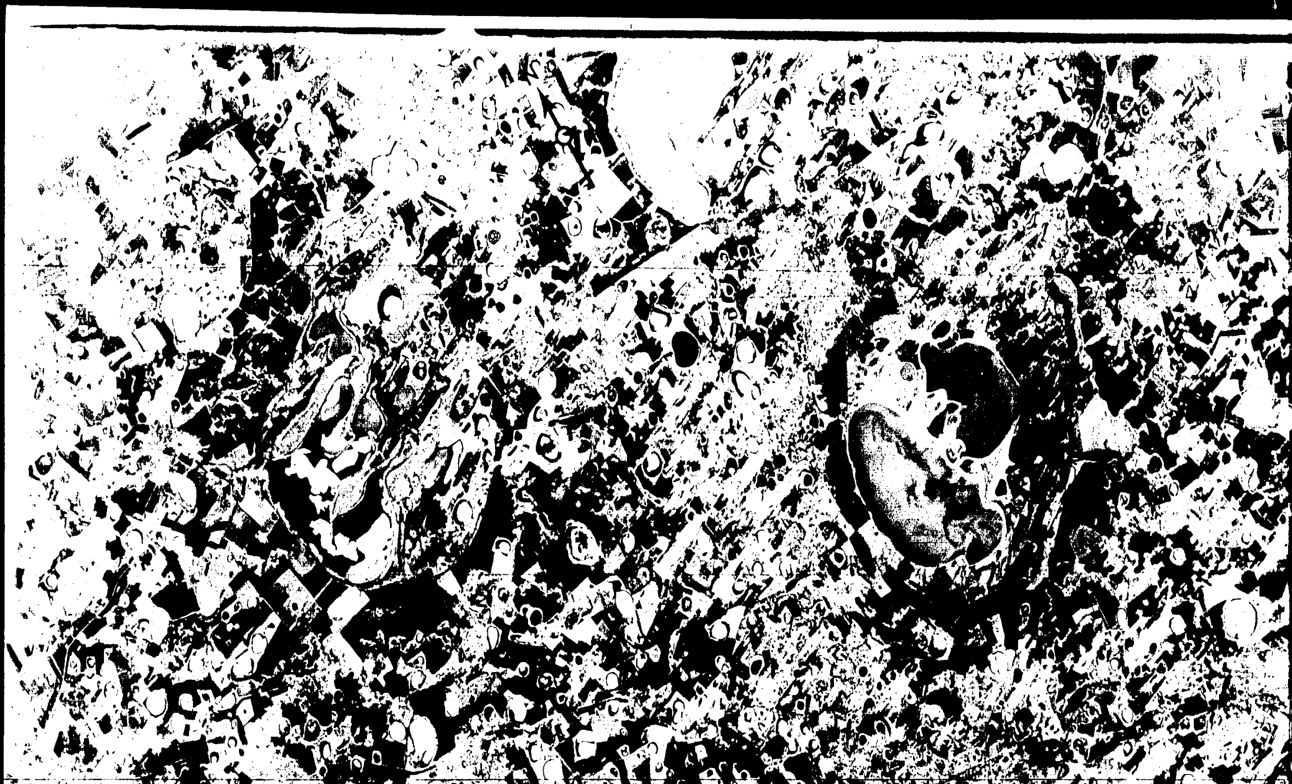
25X1D

3. Lakes northeast of Kokchetav, [redacted]
[illegible]°N. 71°E.



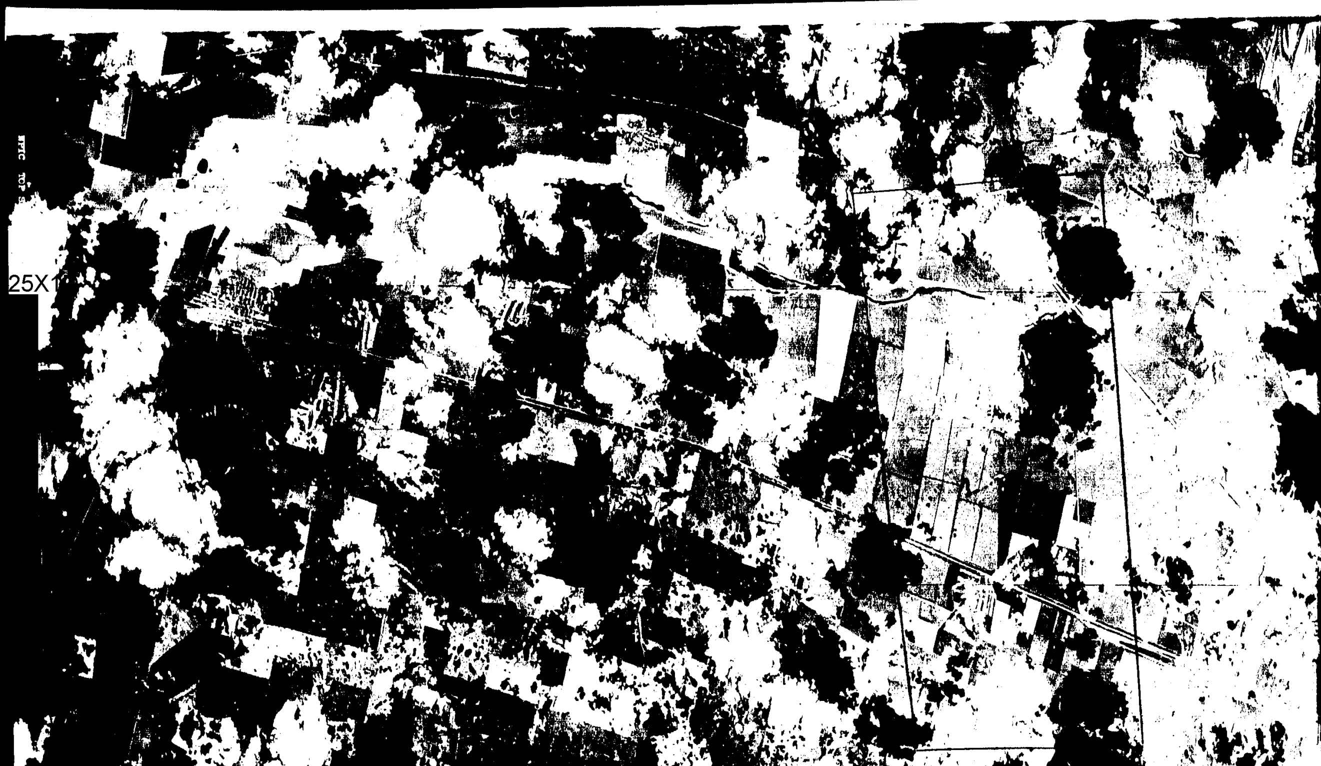
[illegible] northeast of Petropavlovsk, [redacted]
[illegible]

25X1D



northwest of Petropavlovsk, [redacted]

25X1



10. Field pattern west of Omsk, [redacted]
55°N. 73°10'E.

25X1D

14. Field pattern west of [redacted]
35°N. 73°1'E.

25X1D

25X1D [redacted] is outlined on photography on

25X1D

[redacted]

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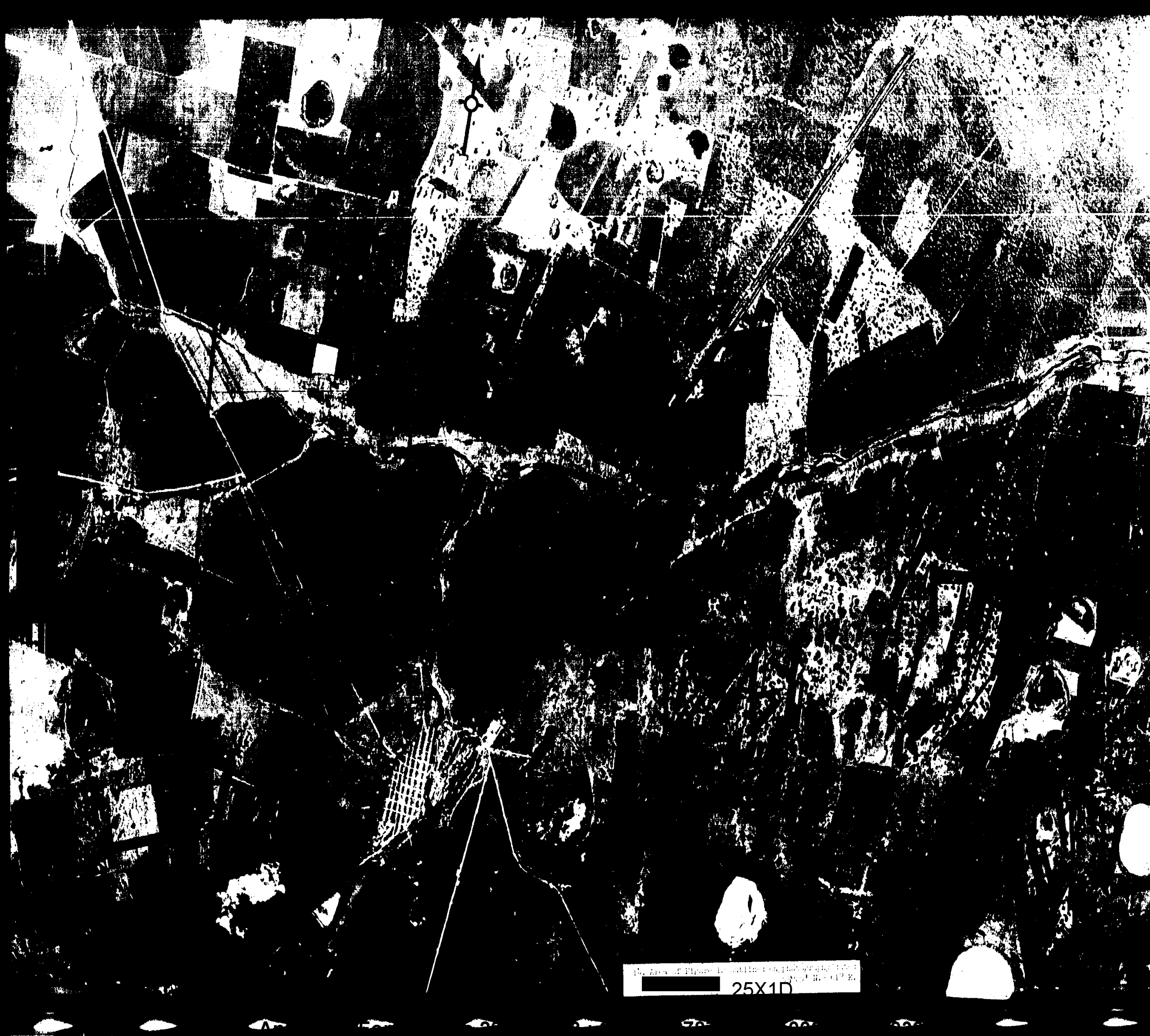
[redacted]
25X1D

[redacted] 25X1D

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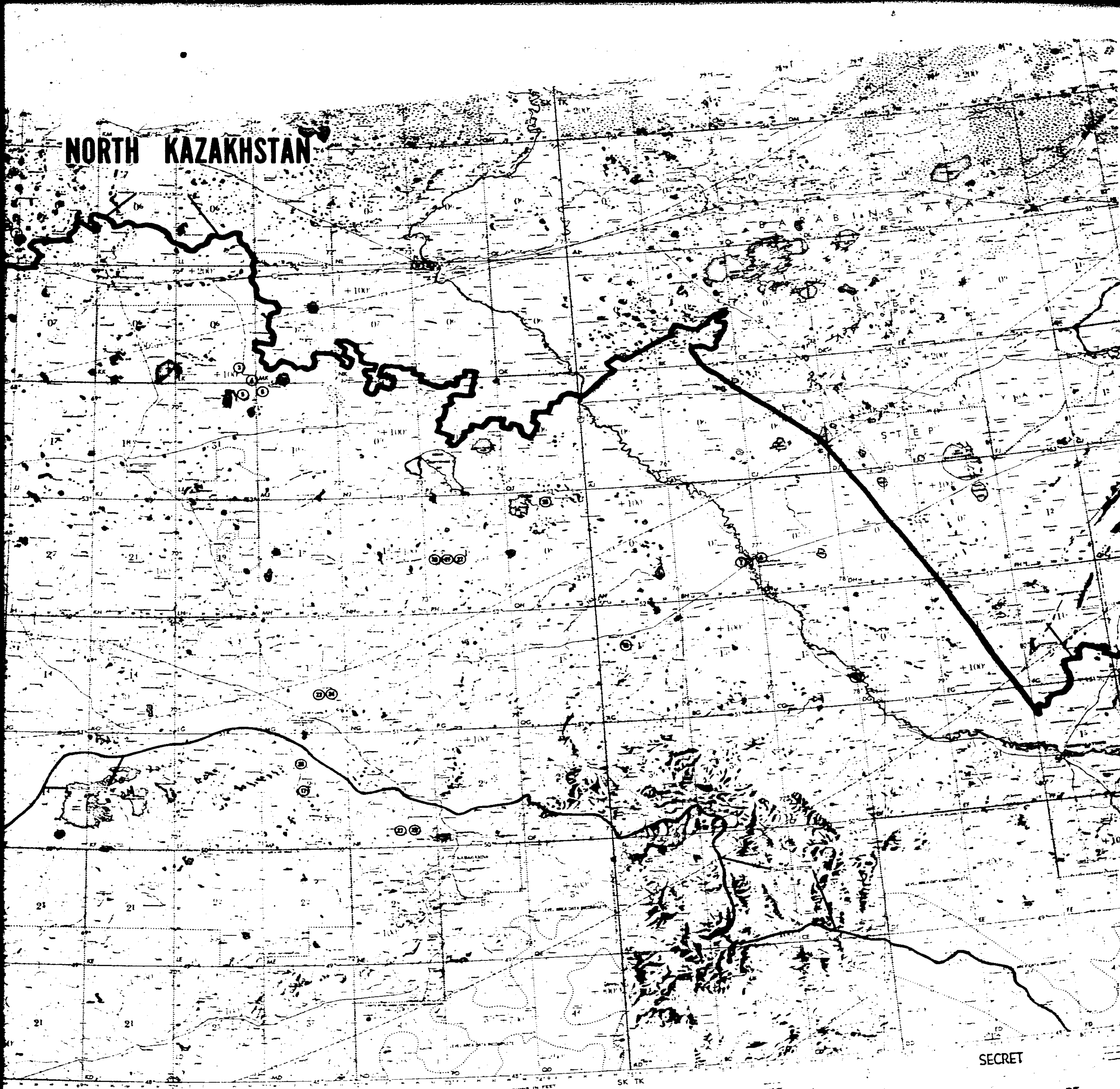
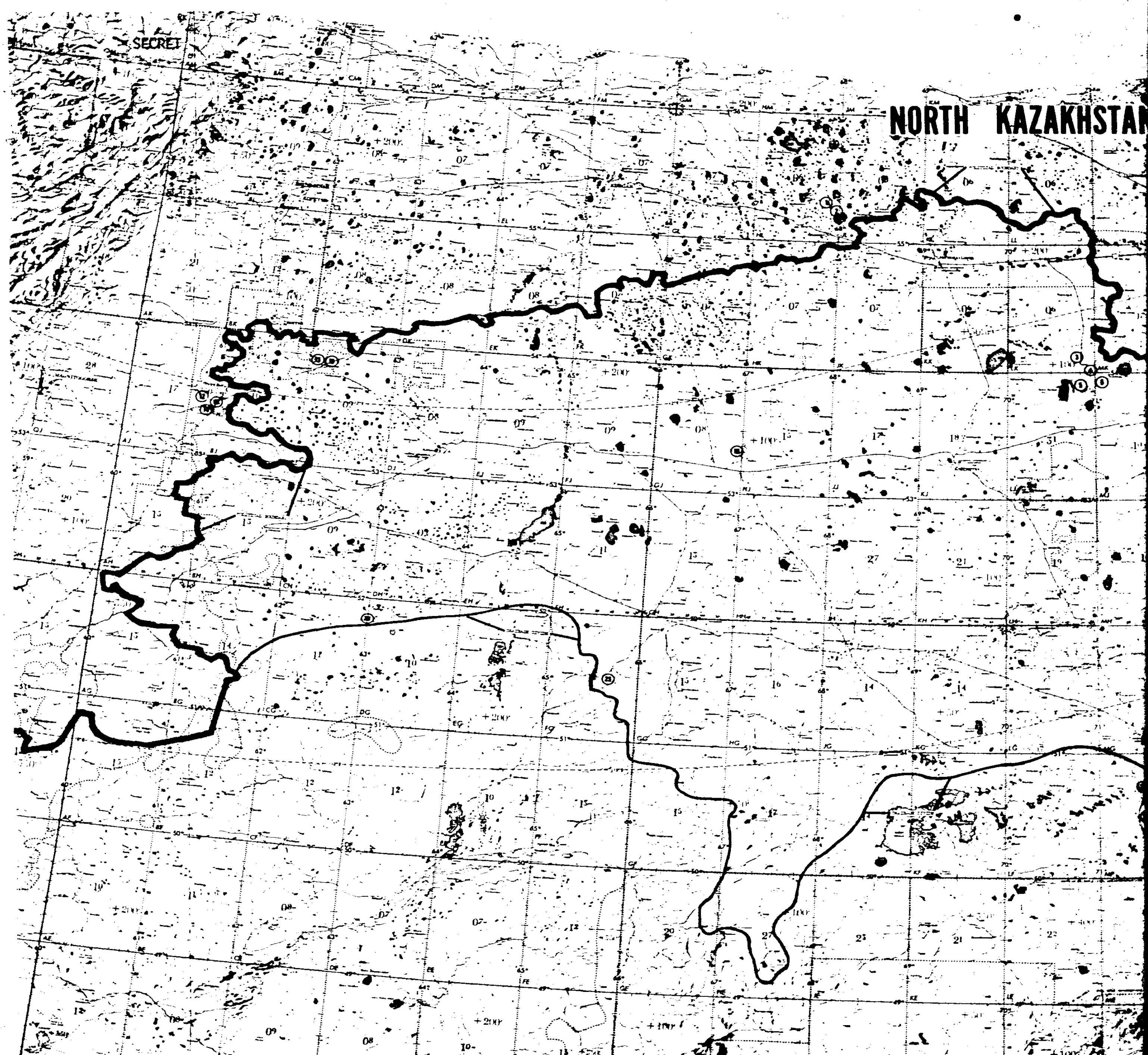
24. Road and field pattern northeast of [illegible]

[redacted] 25X1D

4. Road and field pattern northeast of Akdinck,
[redacted] 25X1D °N. 71° 'E.


NORTH KAZAKHSTAN
B A R A B I N S K A Y A
S T E P
SECRET
ATION CHART



AL NAVIGATION CHA

Approved For Release 2001/03/03 : CIA-RDP78T05439A000300020039-8

SECRET NOFORN

PID/IB - 336/63
26 November 1963
Copy 1 of 8

MEMORANDUM FOR: Chief, Manufacturing and Services Division, ORR

25X1A

ATTENTION : [redacted], MS/D

THROUGH : Chief, Requirements Branch, Reconnaissance Group, CGS

FROM : Chief, CIA/PID (NPIC)

SUBJECT : Canton Arsenal Complex

REFERENCE : (1) ORR Requirement No. C-RR3-80,522/63
(2) CIA/PID Project No. C 1422-63

1. This memorandum is in response to the referenced requirement which asks for an analysis of arsenals at Canton, including current production activity and expansion since [redacted] 25X1D

2. Analysis of photographic coverage of Canton reveals [redacted] The 25X1D Shih-ching Arsenal (also called Kuang-chou Arsenal, Chih-ching, [redacted] 25X1A 25X1A [redacted] located on US Air Target Chart-Series 200-0614-1A, 1st Editon, April 25X1D 1959, [redacted] Analysis of photo coverage of the area outlined on this chart shows that it contains a brick plant, residential areas, a few warehouses and some small shops, none of which contain adequate facilities to produce the weapons which are reported to be produced by this plant.

25X1A 3. The photo analysts assigned to this project were [redacted] 25X1A [redacted] who may be contacted on extension 2547 should you have further questions regarding this project. This memorandum completes the referenced requirement.

25X1A [redacted]

S-10150

TOP SECRET RUFF

TCS No. 4822-KH
G-MB 772/63
26 Nobember 1963
No. Copy 1

MEMORANDUM FOR: Chief, Resourcess Division, ORR

25X1A ATTENTION: [redacted]

FROM: Chief, CIA/PID (NPIC)

SUBJECT: New Lands, USSR

REFERENCES: Requirement No. C-RR3-80,812 (Project No. C 1655-63)

1. In response to Requirement No. C-RR3-80,812 (C 1655-63), photographic enlargements of preselected frames from KEYHOLE Mission
25X1D [redacted] were prepared for your office.

2. Forwarded for your retention are 9 photographic enlargements (CIA/PID/GMB/P-5054/63 thru P-5062/63, copy 1).

3. For any additional information concerning this project contact
25X1A [redacted], CIA/PID/GMB (NPIC) on ext. 3436.

25X1A [redacted]

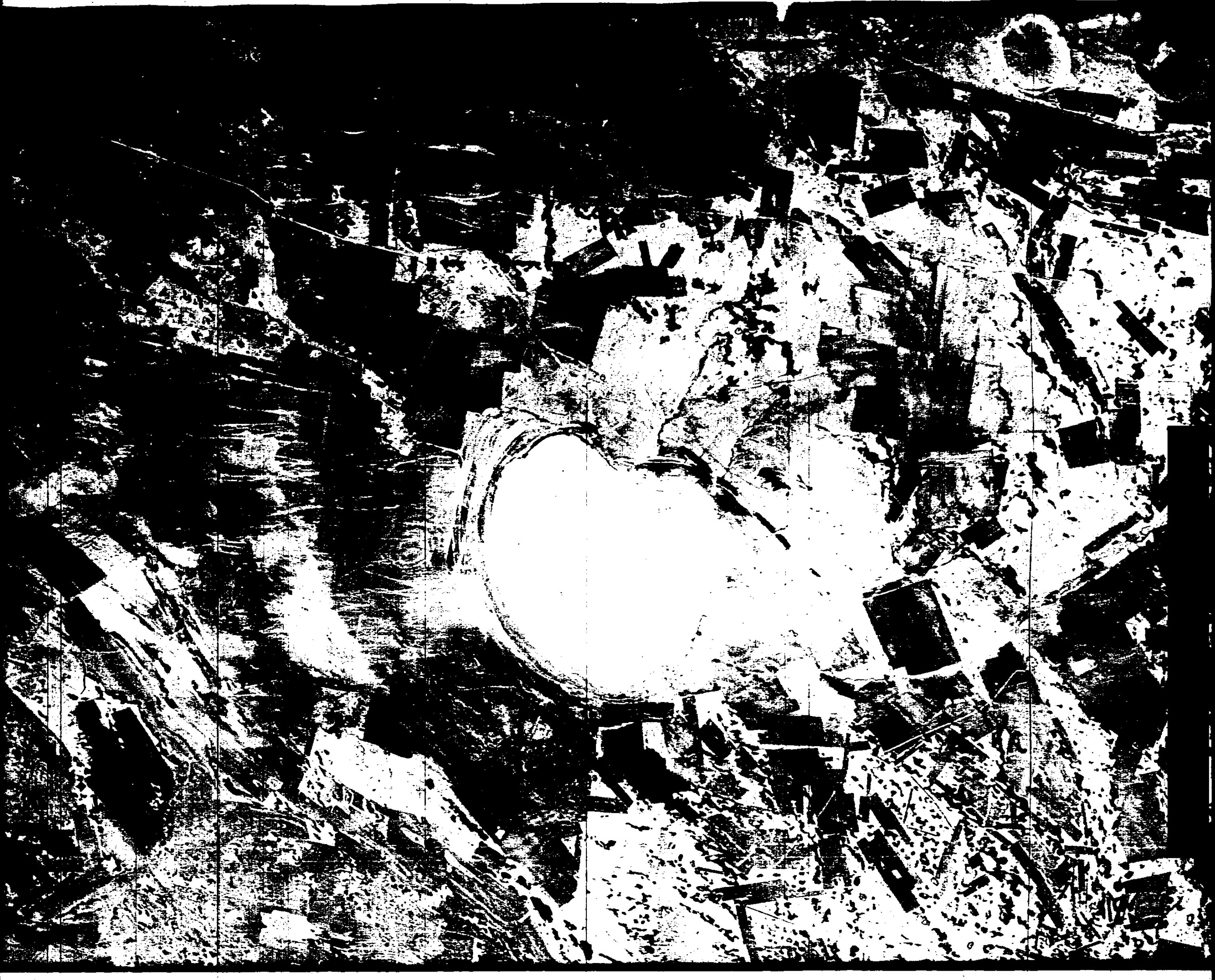
ENCLOSURES:
9 Photographic enlargements (CIA/PID/GMB/[redacted]

S-10151

TOP SECRET RUFF

GROUP 1
Excluded from automatic downgrading and declassification

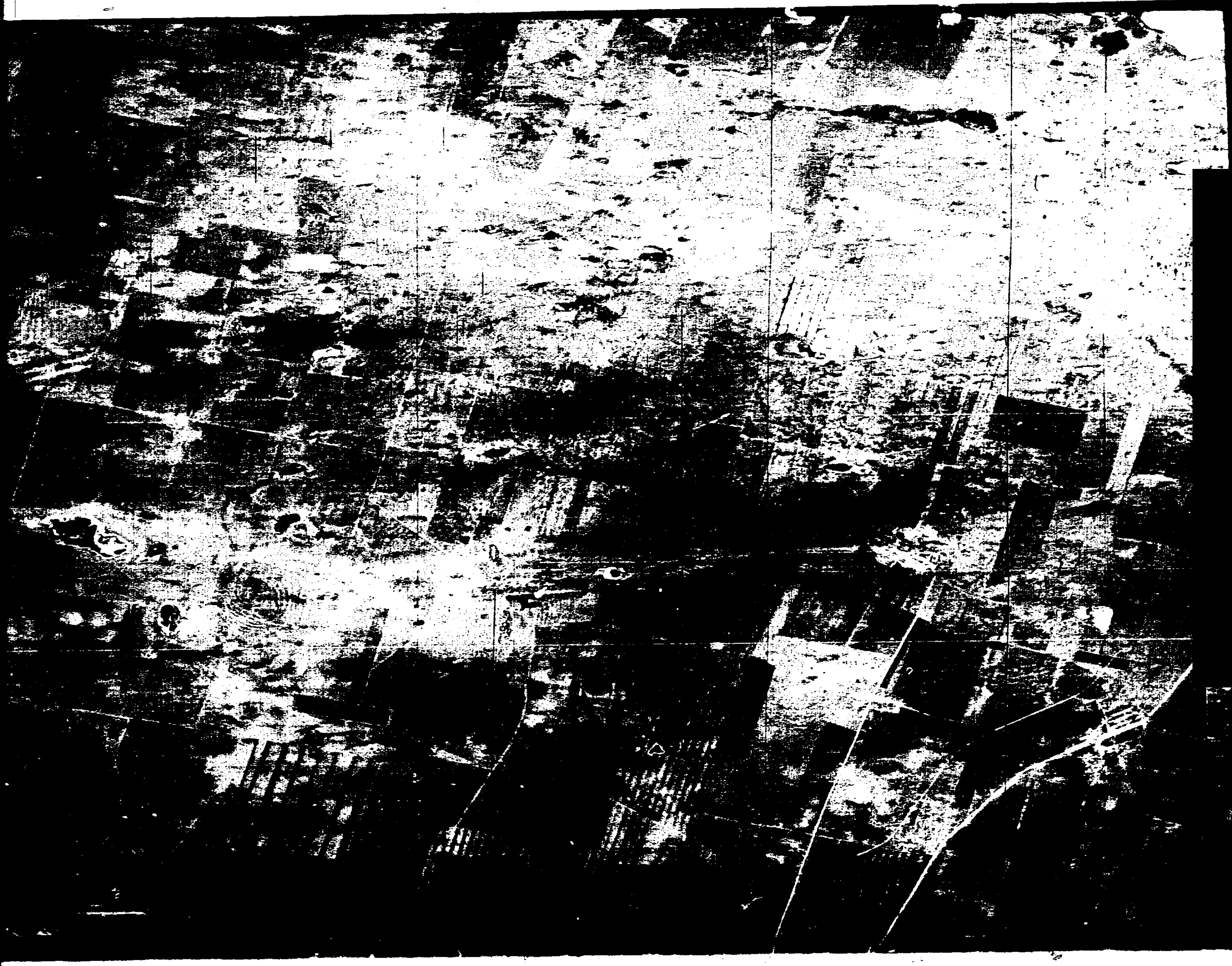
25X1D



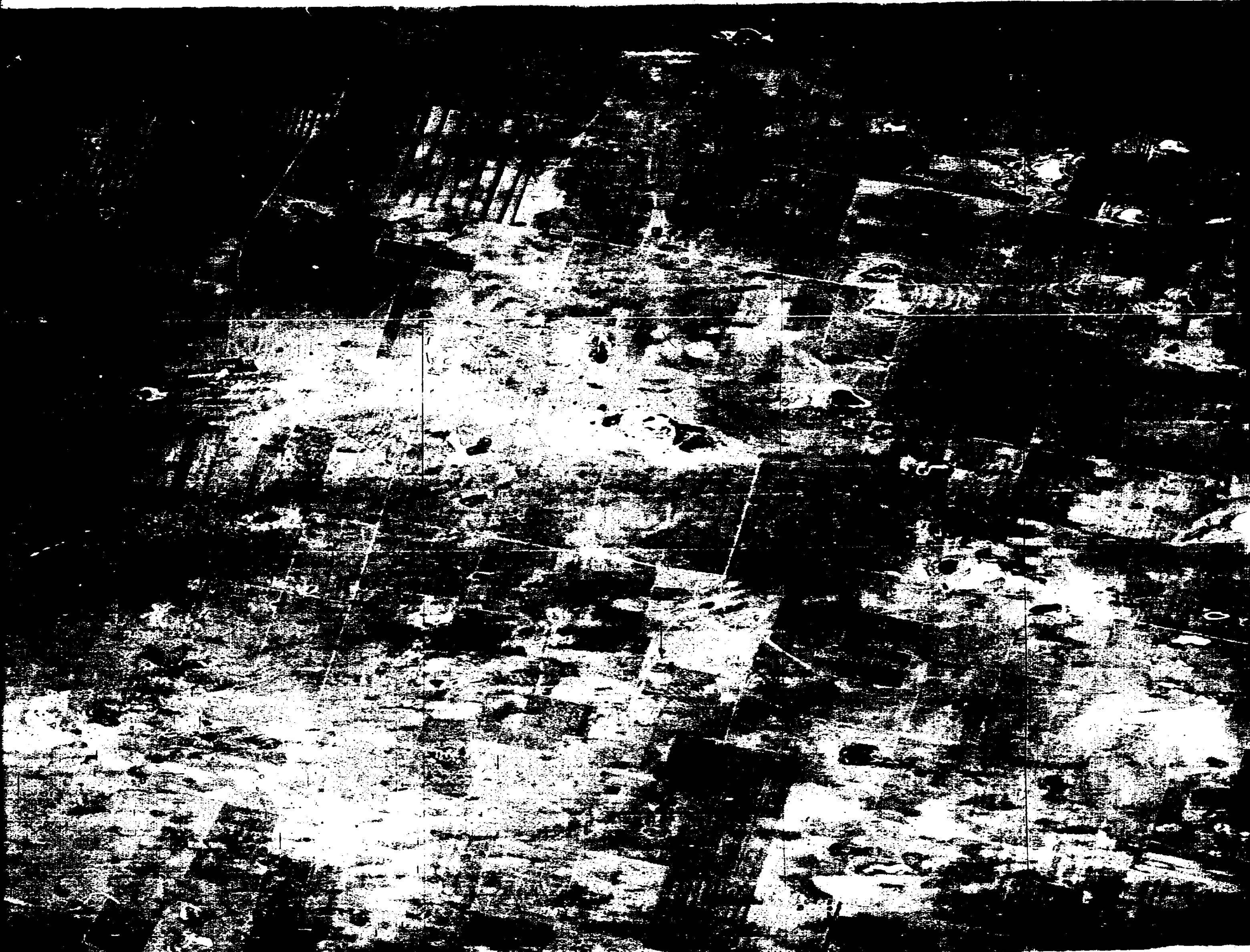
25X1D


25X1D

25X1D



25X1D



25X1D

25X1D

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Approved For Release 2001/03/03 : CIA-RDP78T05439A000300020039-8